TOYOTOMI

Service Manual

MODEL: GAN-A128GVR-T3
GAG-A128GVR-T3
GAN-A135GVR-T3
GAG-A135GVR-T3
(Refrigerant R410A)

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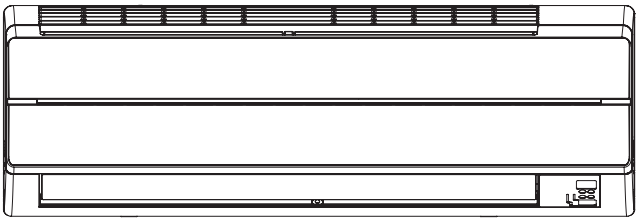
Part Ⅰ: Technical Information

1. Summary

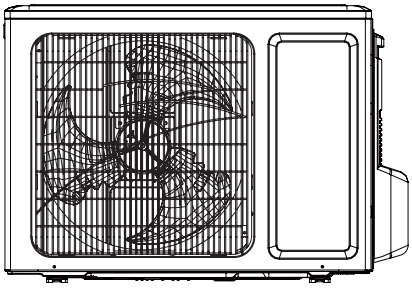
GAG-A128GVR-T3 GAG-A135GVR-T3

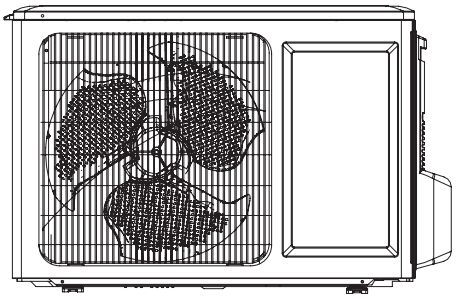
Indoor Unit:

GAN-A128GVR-T3
GAN-A135GVR-T3



Outdoor Unit:





Remote Controller:

YB1F2

2. Specifications

2.1 Specification Sheet

Model			GAN-A128GVR-T3 GAG-A128GVR-T3	GAN-A135GVR-T3 GAG-A135GVR-T3
Product Code			CB146029600_ K93261	CB146029800_ K93261
Power Supply	Rated Voltage	V~	220-240	220-240
	Rated Frequency	Hz	50	50
	Phases		1	1
Power Supply Mode			Indoor	Indoor
Cooling Capacity(Min~Max)		W	2600(450~3230)	3500(600~3960)
Heating Capacity(Min~Max)		W	3000(450~4100)	3800(600~5130)
Cooling Power Input(Min~Max)		W	870(200~1420)	1150(220~1550)
Heating Power Input(Min~Max)		W	900(200~1550)	1100(220~1650)
Cooling Current Input		A	3.8	5.1
Heating Current Input		A	4	4.9
Rated Input		W	1550	1650
Rated Cooling Current		A	6.3	6.9
Rated Heating Current		A	6.9	7.3
Air Flow Volume (SH/H/M/L)		m^3/h	600/520/370/280	680/560/410/300
Dehumidifying Volume		L/h	0.8	1.4
EER		W/W	/	/
COP		W/W	/	/
SEER			5.6	5.1
HSPF			/	/
Application Area		m^2	12-18	16-24
Indoor Unit	Indoor Unit Model		GAN-A128GVR-T3	GAN-A135GVR-T3
	Indoor Unit Product Code		CB146N29600_K93261	CB146N29800_K93261
	Indoor Unit Fan Type		Cross-flow	Cross-flow
	Indoor Unit Fan Diameter Length(DXL)	mm	Φ92X596	Φ92X596
	Cooling Speed (SH/H/M/L)	r/min	1350/1100/900/700	1350/1150/950/750
	Heating Speed (SH/H/M/L)	r/min	1350/1140/980/820	1350/1190/1020/850
	Indoor Unit Fan Motor Power Output	W	10	10
	Indoor Unit Fan Motor RLA	A	0.16	0.16
	Indoor Unit Fan Motor Capacitor	μF	1.2	1.2
	Evaporator Form		Aluminum Fin-copper Tube	Aluminum Fin-copper Tube
	Evaporator Pipe Diameter	mm	Φ7	Φ7
	Evaporator Row-fin Gap	mm	2-1.4	2-1.4
	Evaporator Coil Length (LXDXW)	mm	610X24X294	610X24X294
	Swing Motor Model		MP24BA	MP24BA
	Swing Motor Power Output	W	1.5	1.5
	Fuse Current	A	3.15	3.15
	Indoor Unit Sound Pressure Level (SH/H/M/L)	dB (A)	41/38/30/24	42/39/31/25
	Indoor Unit Sound Power Level (SH/H/M/L)	dB (A)	55/52/44/38	56/53/45/39
	Indoor Unit Dimension (WXHXD)	mm	770X283X201	770X283X201
	Indoor Unit Dimension of Carton Box (LXWXH)	mm	844X342X261	844X342X261
	Indoor Unit Dimension of Package (LXWXH)	mm	847X345X276	847X352X276
	Indoor Unit Net Weight	kg	8	9
	Indoor Unit Gross Weight	kg	11	12

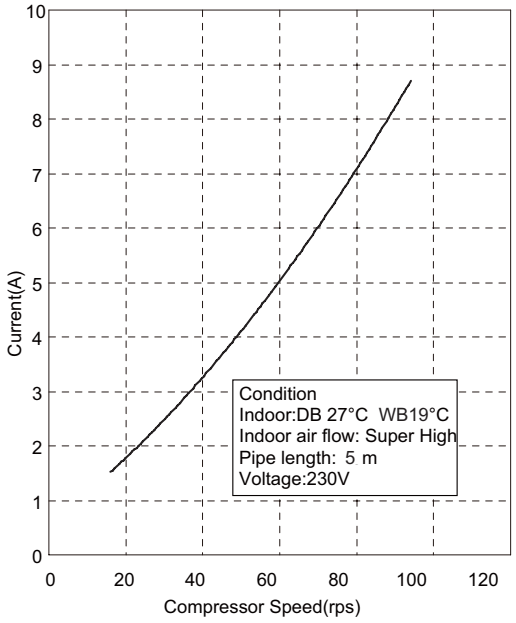
Outdoor Unit	Outdoor Unit Model		GAG-A128GVR-T3	GAG-A135GVR-T3
	Outdoor Unit Product Code		CB146W25600_K93261	CB146W25700_K93261
	Compressor Manufacturer		ZHUHAI LANDA COMPRESSOR CO.,LTD	ZHUHAI LANDA COMPRESSOR CO.,LTD
	Compressor Model		QXA-A091zE190A	QXA-A091zE190A
	Compressor Oil		RB 68EP	RB 68EP
	Compressor Type		Rotary	Rotary
	Compressor Locked Rotor Amp (L.R.A)	A	20	20
	Compressor Rated Load Amp (RLA)	A	4.5	4.5
	Compressor Power Input	W	942	942
	Compressor Overload Protector		1NT11L-6233	1NT11L-6233
	Throttling Method		Electron expansion valve	Electron expansion valve
	Set Temperature Range	°C	16~30	16~30
	Cooling Operation Ambient Temperature Range	°C	18~43	18~43
	Heating Operation Ambient Temperature Range	°C	-7~24	-7~24
	Condenser Form		Aluminum Fin-copper Tube	Aluminum Fin-copper Tube
	Condenser Pipe Diameter	mm	Φ7	Φ9.52
	Condenser Rows-fin Gap	mm	2-1.4	2-1.4
	Condenser Coil Length (LXDXW)	mm	710X19.05X508	710X38.1X508
	Outdoor Unit Fan Motor Speed	rpm	900	860
	Outdoor Unit Fan Motor Power Output	W	30	35
	Outdoor Unit Fan Motor RLA	A	0.24	0.3
	Outdoor Unit Fan Motor Capacitor	μF	/	2.5
	Outdoor Unit Air Flow Volume	m^3/h	1600	1800
	Outdoor Unit Fan Type		Axial-flow	Axial-flow
	Outdoor Unit Fan Diameter	mm	Φ400	Φ394.5
	Defrosting Method		Automatic Defrosting	Automatic Defrosting
	Climate Type		T1	T1
	Isolation		I	I
	Moisture Protection		IP24	IP24
	Permissible Excessive Operating Pressure for the Discharge Side	MPa	4.3	4.3
	Permissible Excessive Operating Pressure for the Suction Side	MPa	2.5	2.5
	Outdoor Unit Sound Pressure Level (H/M/L)	dB (A)	51/-/-	53/-/-
	Outdoor Unit Sound Power Level (H/M/L)	dB (A)	62/-/-	62/-/-
	Outdoor Unit Dimension (WXHXD)	mm	776X540X320	848X540X320
	Outdoor Unit Dimension of Carton Box (LXWXH)	mm	848X360X580	878X360X580
	Outdoor Unit Dimension of Package (LXWXH)	mm	851X363X595	881X363X595
	Outdoor Unit Net Weight	kg	28	30
	Outdoor Unit Gross Weight	kg	32	33.5
	Refrigerant		R410A	R410A
	Refrigerant Charge	kg	0.7	1
Connection Pipe	Connection Pipe Length	m	5	5
	Connection Pipe Gas Additional Charge	g/m	20	20
	Outer Diameter of Liquid Pipe	mm	Φ6	Φ6
	Outer Diameter of Gas Pipe	mm	Φ9.52	Φ9.52
	Max Distance Height	m	10	10
	Max Distance Length	m	15	20
	Note: The connection pipe applies metric diameter.			

The above data is subject to change without notice; please refer to the nameplate of the unit.

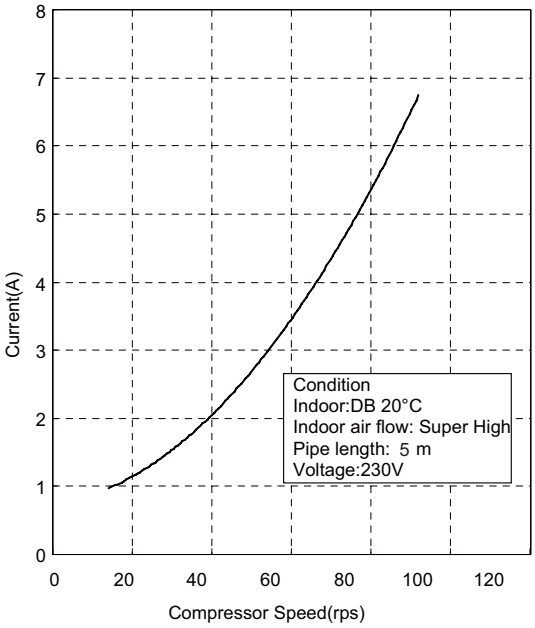
2.2 Operation Characteristic Curve

09&12K Unit

Cooling

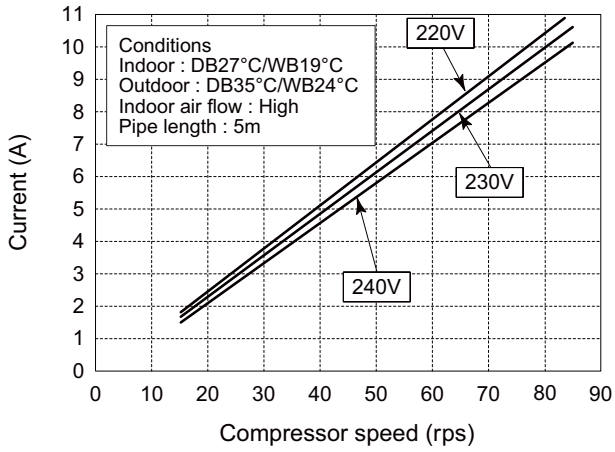


Heating

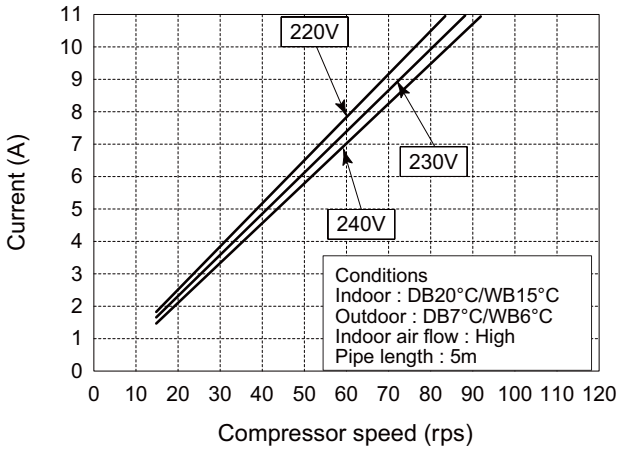


18K Unit

Cooling

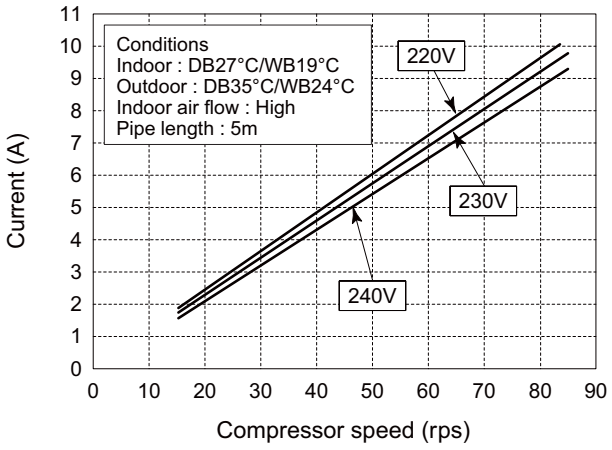


Heating

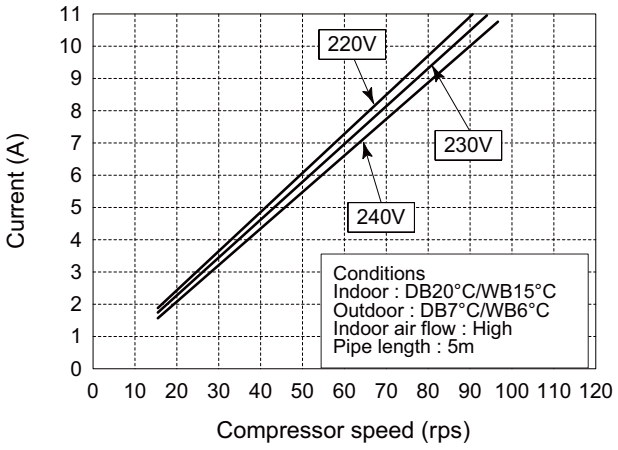


24K Unit

Cooling



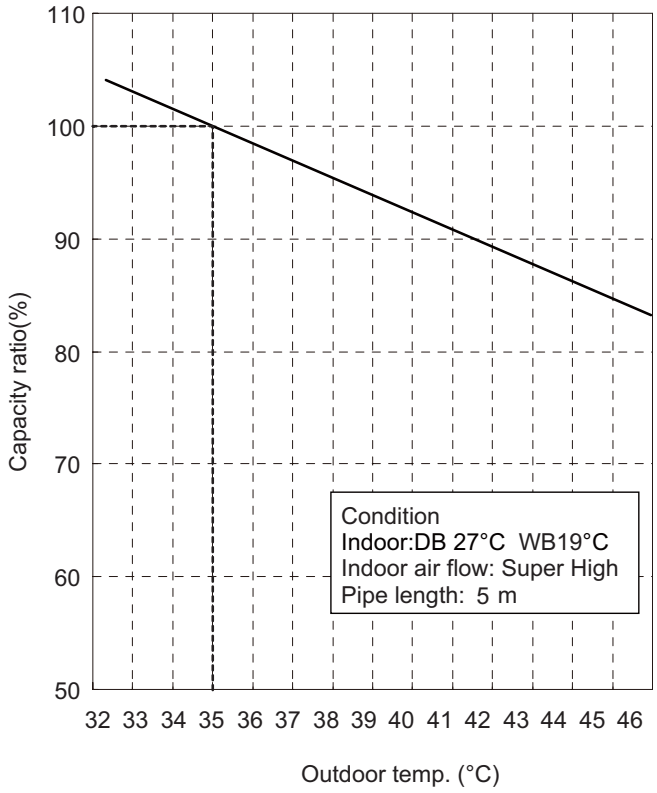
Heating



2.3 Capacity Variation Ratio According to Temperature

09&12K Unit

Cooling



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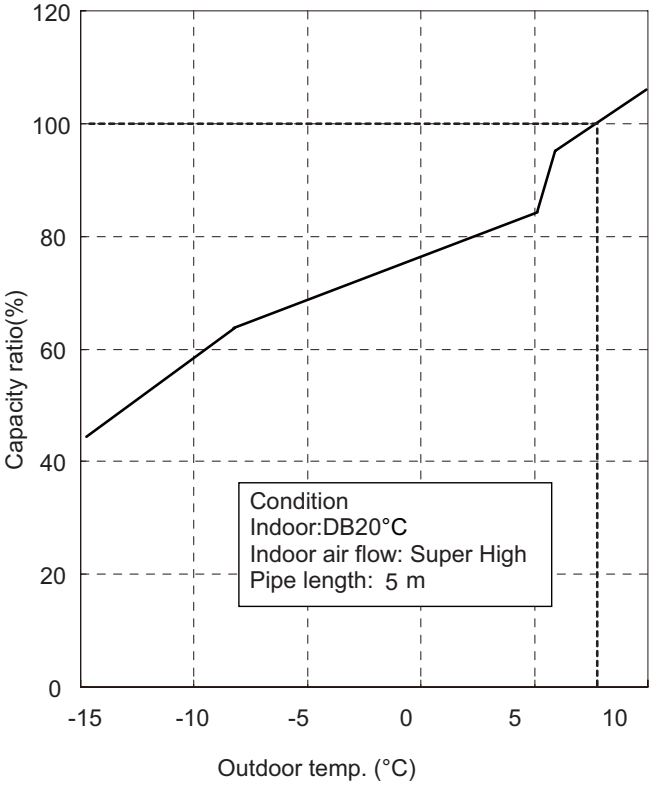
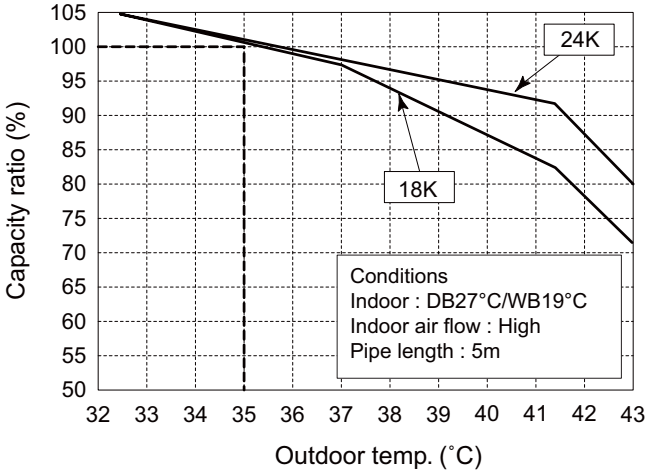
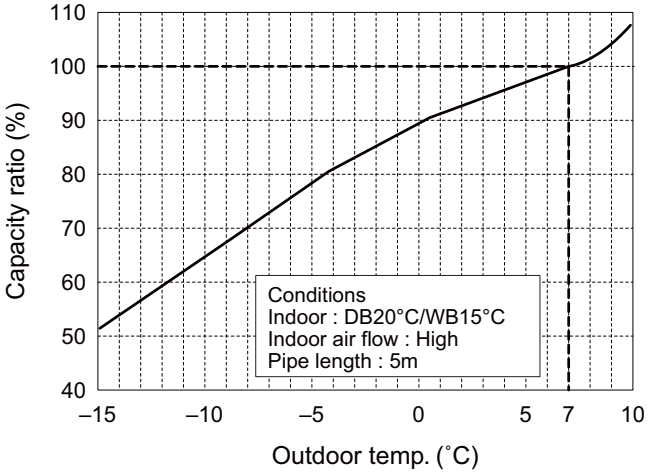


18&24K Unit

Cooling



Heating



2.5 Cooling and Heating Data Sheet in Rated Frequency

Cooling:

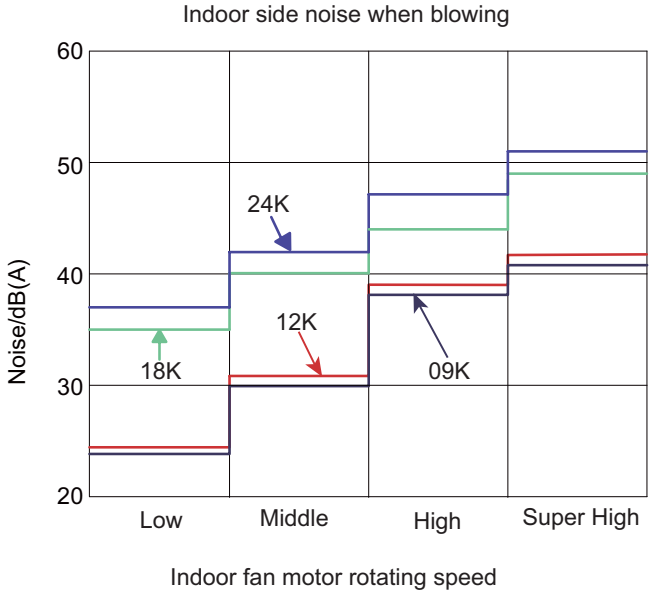
Rated cooling condition(°C) (DB/WB)		Model	Pressure of gas pipe connecting indoor and outdoor unit	Inlet and outlet pipe temperature of heat exchanger		Fan speed of indoor unit	Fan speed of outdoor unit	Compressor revolution (rps)
Indoor	Outdoor		P (MPa)	T1 (°C)	T2 (°C)			
27/19	35/24	09K	0.9 to 1.1	12 to 14	75 to 37	Super High	High	/
		12K	0.8 to 1.0	10 to 12	85 to 43			
		18K	0.9 to 1.1	12 to 14	70 to 40			73
		24K	0.8 to 1.0	10 to 12	72 to 40			80

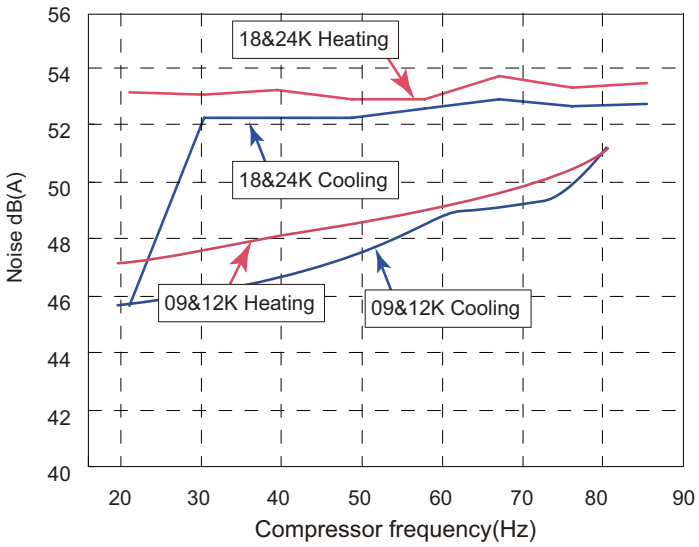
Heating:

Rated cooling condition(°C) (DB/WB)		Model	Pressure of gas pipe connecting indoor and outdoor unit	Inlet and outlet pipe temperature of heat exchanger		Fan speed of indoor unit	Fan speed of outdoor unit	Compressor revolution (rps)
Indoor	Outdoor		P (MPa)	T1 (°C)	T2 (°C)			
20/15	7/6	09K	2.4 to 2.6	70 to 35	2 to 4	Super High	High	/
		12K						
		18K	2.5 to 2.7					69
		24K			0 to 3			75

Instruction:
T1: Inlet and outlet pipe temperature of evaporator
T2: Inlet and outlet pipe temperature of condenser
P: Pressure at the side of big valve
Connection pipe length: 5 m.

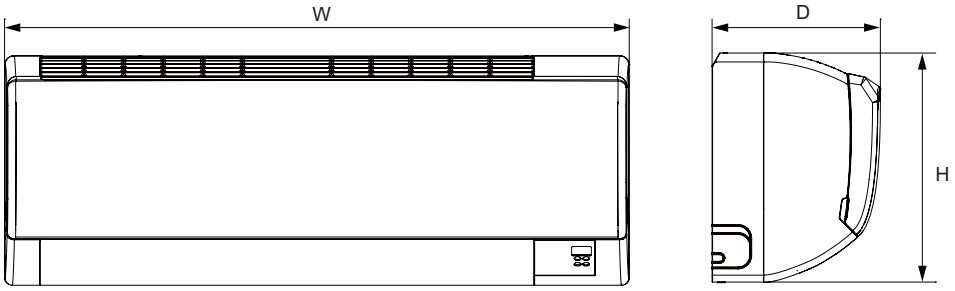
2.4 Noise Curve

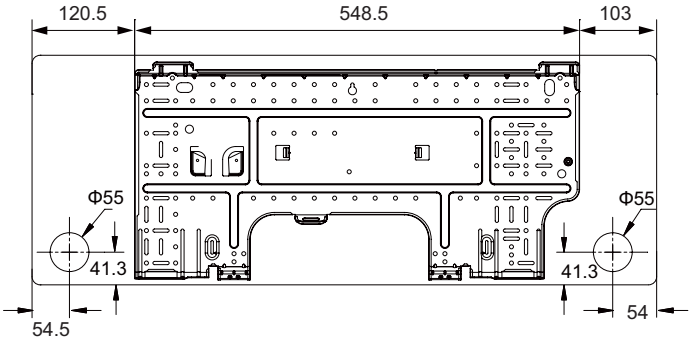




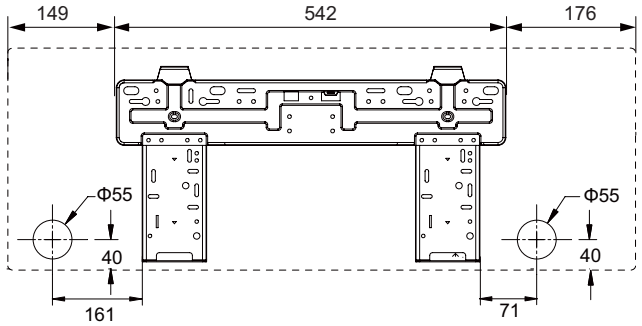
3. Outline Dimension Diagram

3.1 Indoor Unit

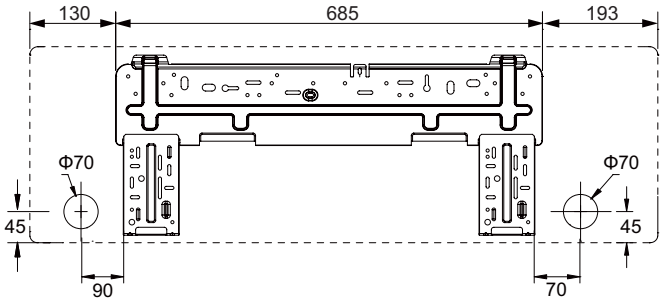




09&12K Unit



18K Unit



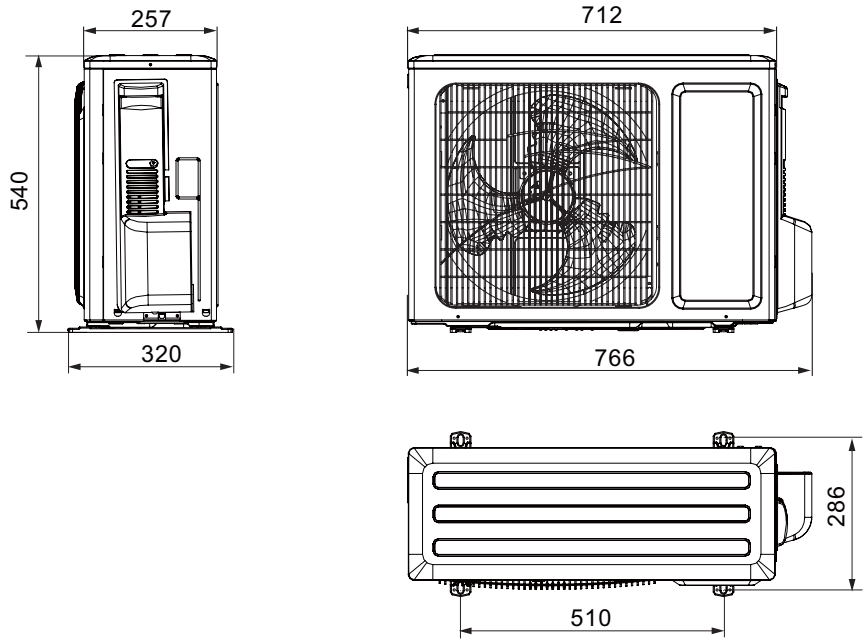
24K Unit

Unit:mm

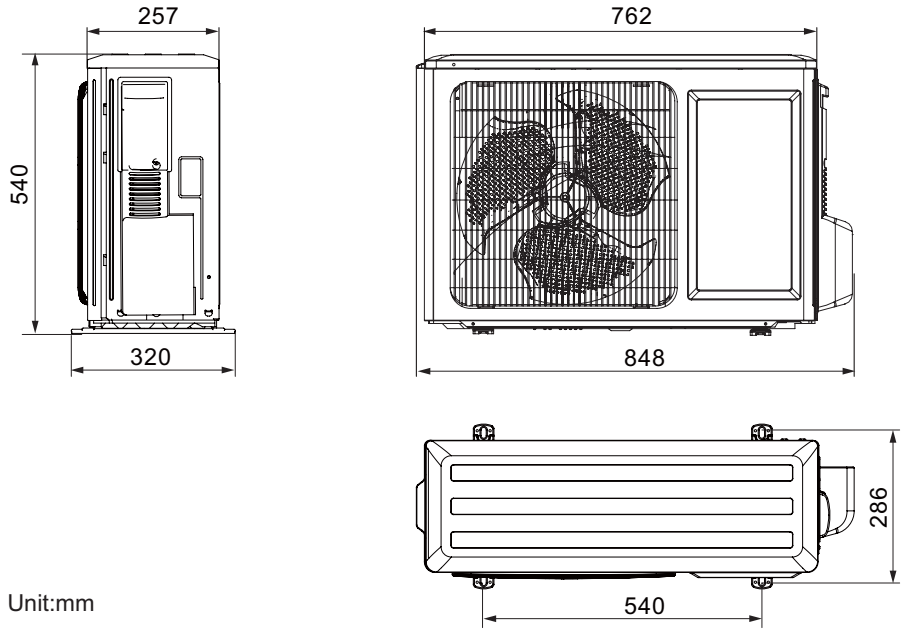
Models	W	H	D
09&12K	770	283	201
18K	867	305	215
24K	1008	319	221

3.2 Outdoor Unit

(1)GAG-A128GVR-T3



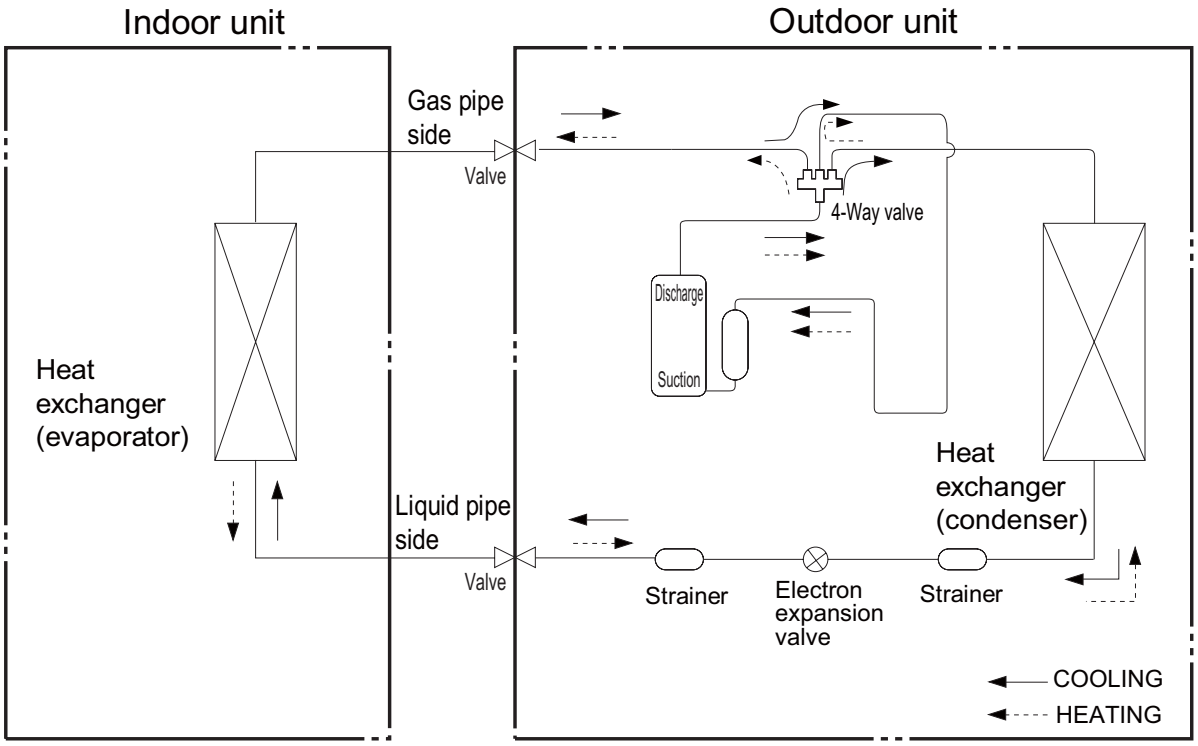
(2)GAG-A135GVR-T3



Unit:mm

4. Refrigerant System Diagram

(1)09&12K Unit



Refrigerant pipe diameter
Liquid :1/4" (6 mm) Gas : 3/8" (9.52 mm)

Refrigerant pipe diameter
Liquid :1/4" (6 mm) Gas : 1/2" (12 mm)(18K Unit)
Liquid :1/4" (6 mm) Gas : 5/8" (16 mm)(24K Unit)

5. Electrical Part

5.1 Wiring Diagram

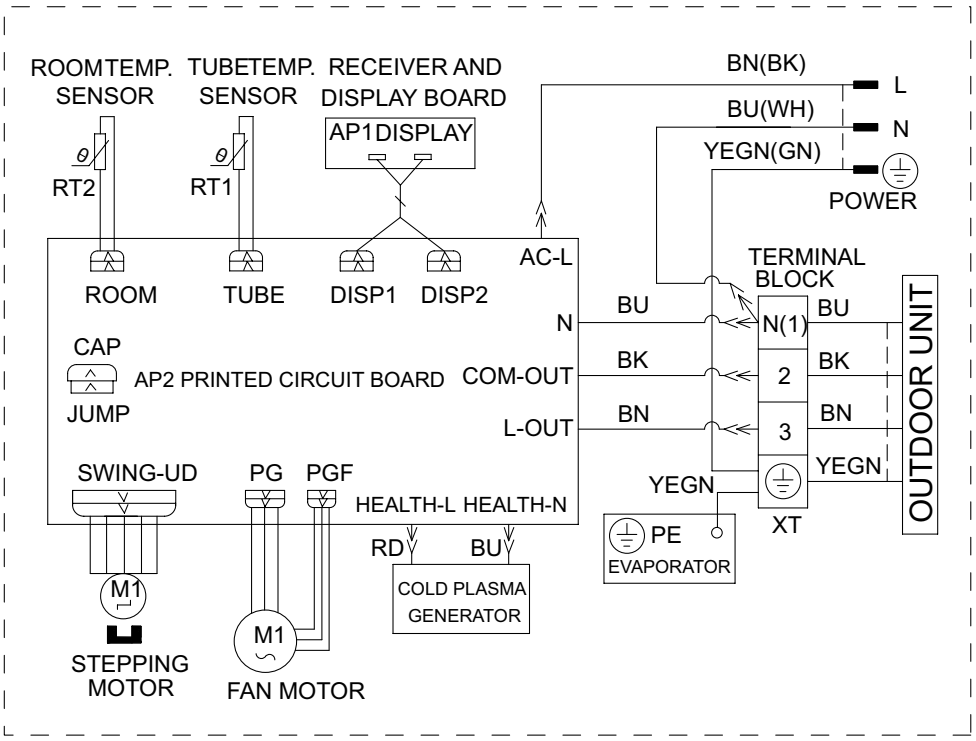
●Instruction

Symbol	Symbol Color	Symbol	Symbol Color	Symbol	Name
WH	White	GN	Green	CAP	Jumper cap
YE	Yellow	BN	Brown	COMP	Compressor
RD	Red	BU	Blue	⏚	Grounding wire
YEGN	Yellow/Green	BK	Black	/	/
VT	Violet	OG	Orange	/	/

Note: Jumper cap is used to determine fan speed and the swing angle of horizontal lover for this model.

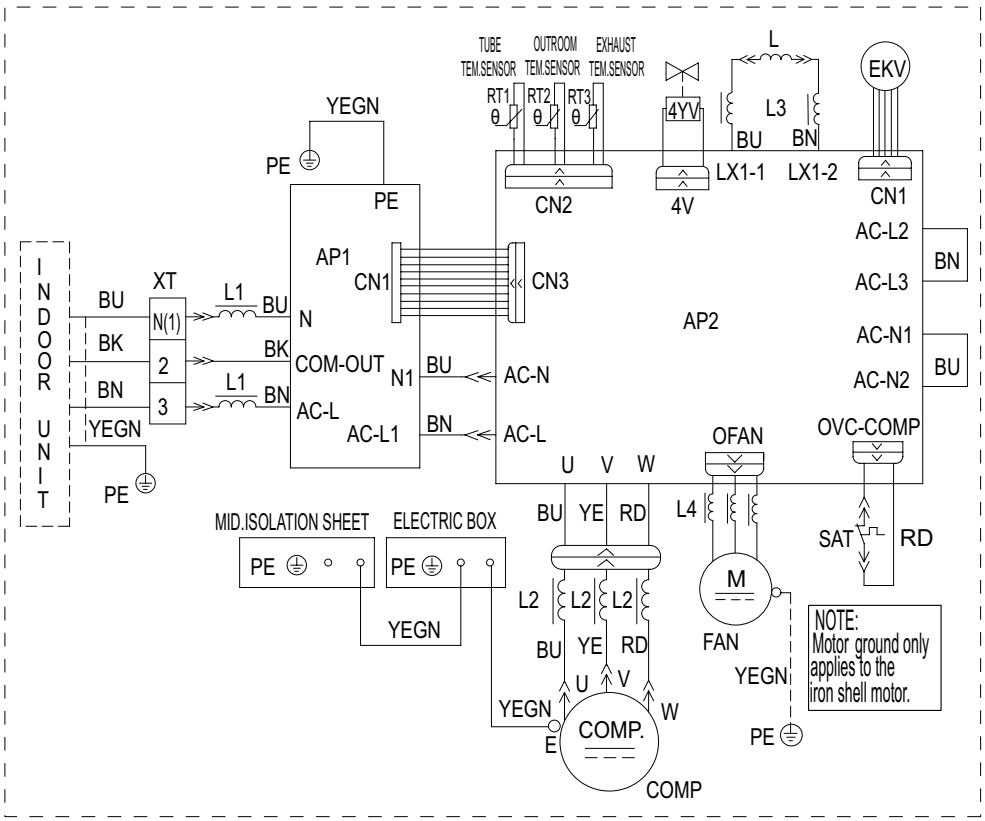
● Indoor Unit

(1)GAN-A128GVR-T3 GAN-A135GVR-T3

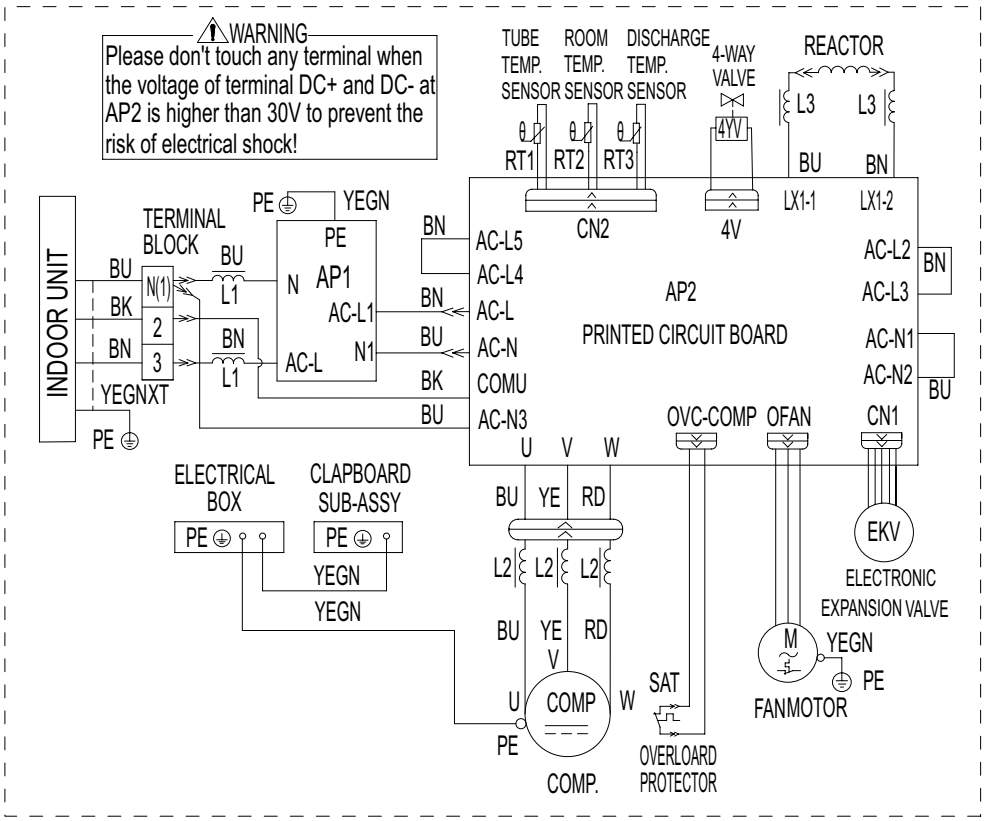


● Outdoor Unit

(1)GAG-A128GVR-T3



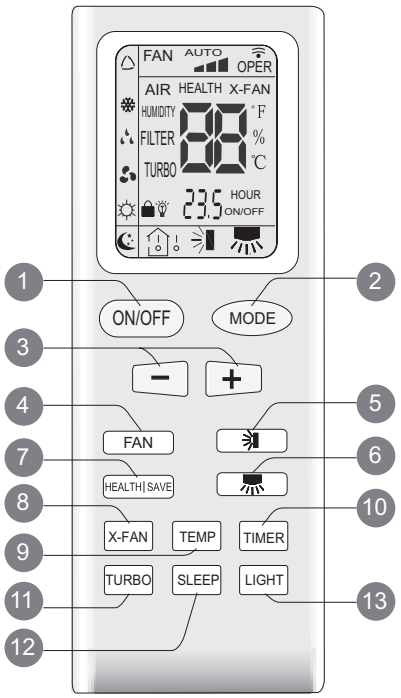
(2)GAG-A135GVR-T3



6. Function and Control

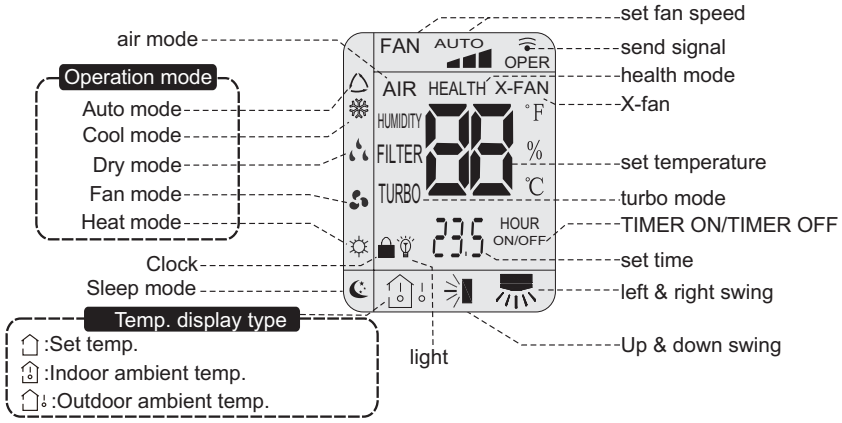
6.1 Remote Controller Introduction

Buttons on Remote Controller



1. ON/OFF button
2. MODE button
3. +/- button
4. FAN button
5. button
6. button
7. HEALTH $AVE button
8. X-FAN button
9. TEMP button
10. TIMER button
11. TURBO button
12. SLEEP button
13. LIGHT button

Introduction for Icons on Display Screen



Introduction for Buttons on Remote Controller

Note:

● After putting through power, air conditioner will give out a sound and operation indicator " ⏻ is ON (red indicator). You can operate the air conditioner through the remote controller.

● At ON status, after each pressing button on remote controller, the signal icon " on remote controller will flash once. Air conditioner will give out a sound, which indicates the signal has been sent to air conditioner.

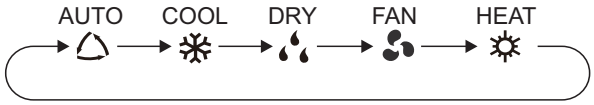
● At OFF status, display screen on remote controller displays set temperature.At on status, display screen on remote controller displays the corresponding startup function's icon.

1. ON/OFF button

Press this button can turn on or turn off the air conditioner. After turning on the unit,operation indicator "⏻" on indoor unit is ON (green indicator. Color may be different for different models)and indoor unit gives out a sound.

2. MODE button

Press this button can select your required operation mode.



● After selecting auto mode, air conditioner will operate automatically according to ambient temperature. Set temperature can't be adjusted and also can't be displayed. Press "FAN" button can adjust fan speed. Press "↕" button and "≋" button can adjust swing angle.

● After selecting cool mode, air conditioner operates under cool mode. Cool indicator "❄" on indoor unit is ON. You can press "+" or "-" button to adjust set temperature.

Press "FAN" button can adjust fan speed. Press "↕" button and "≋" button can adjust swing angle.

● After selecting dry mode, air conditioner operates under dry mode at low speed. Dry indicator " 💧" on indoor unit is ON. Under dry mode, fan speed can't be adjusted. Press "↕" button and "≋" button to adjust swing angle.

● After selecting fan mode, air conditioner operates only under fan mode, All mode indicators on indoor unit is OFF. Press "FAN" button can adjust fan speed. Press "↕" button and "≋" button to adjust swing angle.

● After selecting heat mode, air conditioner operates under heat mode. Heat indicator "☼" on indoor unit is ON. You can press "+" or "-" button to adjust set temperature.

Press "FAN" button to adjust fan speed. Press "↕" button and "≋" button to adjust swing angle. (Cooling only unit can't receive the signal for heating mode.)

Note:

For preventing cold wind, after starting up heating mode, indoor fan will blow fan after delaying 1-5min. (Details time is decided by indoor ambient temperature).

Temperature setting range on remote controller: 16°C~30°C. Fan speed setting range: auto, low speed, medium speed and high speed.

3. "+" or "-" button

● After each pressing of "+" or "-" button, it can increase or decrease set temperature 1°C. Hold "+" or "-" button, 2s later, set temperature on remote controller will change quickly. After reaching to your required time, loosen the button.

Temperature indicator on indoor unit will also change accordingly. (Temperature can't be adjusted under auto mode)

● Under TIMER ON, TIMER OFF or Clock setting, you can press "+"or "-" button to adjust time. (Refer to TIMER button for details)

4. FAN button

Press this button you can select the fan speed in sequence: auto (AUTO), low speed (◢), medium speed (◢◢), high speed (◢◢◢).

Note:

● Under auto mode, air conditioner will select proper fan speed according to ex-factory setting automatically. Air conditioner will select proper fan speed according to ex-factory setting automatically.

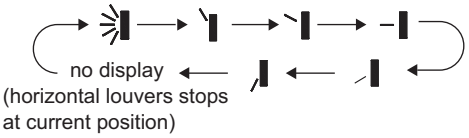
● Low speed under dry mode.

5. ↕ button

Press this button can select up&down swing. Swing angle can be selected in sequence as below:

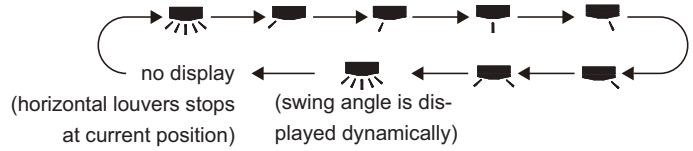
When selecting "↕" with remote controller, it's auto swing. Horizontal louver of air conditioner will swing up&down automatically at the maximum angle.

When selecting " ▮、▮、▮、▮、▮" with remote controller, it's the fixed position swing. Horizontal louver of air conditioner will stop at that position as shown by the icon to swing.



6. button

Press this button can select left&right swing. Swing angle can be selected circularly in sequence as below:



● When selecting "" with remote controller, it's auto swing. Horizontal louver of air conditioner will swing left&right automatically at the maximum angle.

● When selecting "、、、、、" with remote controller, it's the fixed position swing. Horizontal louver of air conditioner will stop at that position as shown by the icon to swing.

● When selecting " (swing angle is displayed dynamically) ", it's the circulating swing. Horizontal louver of air conditioner will swing circularly according to the angle as shown by the icon.

7. HEALTH SAVE button

HEALTH Function:

After pressing HEALTH button, remote controller will switch circularly as below:

"HEALTH"→"AIR"→"AIR HEALTH"→"no display"

● When selecting "HEALTH" by remote controller, HEALTH function will be started up.

● When selecting "AIR" by remote controller, AIR function will be started up.

● When selecting "AIT HEALTH", AIR and HEALTH function will be started up.

● When there's no display on remote controller, AIR and HEALTH function will be turned off.

SAVE Function:

Under cool mode, press SAVE button and the unit will operate under SAVE mode.

Dual-8nixie tube on remote controller displays "SE". Air conditioner will operate at auto speed. Set temperature can't be adjusted.

Press SAVE button again to exit

SAVE mode. Air conditioner turn back to original set speed and set temperature.

● This function is applicable to partial of models.

8. X-FAN button

After pressing this button under cooling or dry mode, remote controller displays the character of "X-FAN" and X-FAN function is started up. Press this button again to cancel X-FAN function. The character of "X-FAN" will disappear.

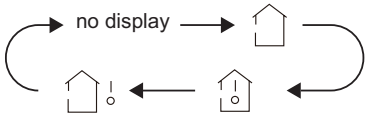
Note:

● After starting up X-FAN function, when turning off the unit, indoor fan will continue to operate for a while at low speed to dry the residual water inside the indoor unit.

● When the unit operates under X-FAN mode, press "X-FAN" button can turn off X-FAN function. Indoor fan stops operation immediately.

9. TEMP button

Press this button can see indoor set temperature, indoor ambient temperature or outdoor ambient temperature on indoor unit's display. Temperature is set circularly by remote controller as below:



● When selecting "" by remote controller or no display, temperature indicator on indoor unit displays set temperature.

● When selecting "" by remote controller, temperature indicator on indoor unit displays indoor ambient temperature.

● When selecting "" by remote controller, temperature indicator on indoor unit displays outdoor ambient temperature.

Note:

● Outdoor ambient temperature display may can't be selected for some models. When indoor unit receives "" signal, it displays indoor set temperature.

● Only for the model whose indoor unit has dual-8 display.

10. TIMER button

● At ON status, press this button once can set TIMER OFF. The character of HOUR and OFF will flash. Press "+" or "-" button within 5s can adjust the time of TIMER ON. After each pressing of "+" or "-" button, time will increase or decrease half an hour. When holding "+" or "-" button, 2s later, the time will change quickly until to reach to your required time. After that, press "TIMER" button to confirm it. The character of HOUR and OFF won't flash again.Cancel TIMER OFF: Press "TIMER" button again under TIMER OFF status.

● At OFF status, press this button once can set TIMER ON. Please refer to TIMER off for detailed operation. Cancel TIMER ON: Press "TIMER" button again under TIMER ON status.

Note:

● Time setting range: 0.5-24 hours.

● Time interval between two operations can't exceed 5s. Otherwise, remote controller will exit the setting status automatically.

11. TURBO button

When pressing this button under cooling or heating mode, air conditioner will enter into quick cooling or quick heating mode. The character of "TURBO" is displayed on remote controller. Press this button again to exit turbo function and the character of "TURBO" will be disappeared on remote controller.

12. SLEEP button

Press this button under cooling, heating or drying mode can start up sleep function." " icon will be displayed on remote controller. Press this button again to cancel sleep function. " "icon on remote controller will be displayed.

13. LIGHT button

Press this button can turn off the light for indoor unit's display. " " icon on remote controller will disappear. Press this button again to turn on the light for indoor unit's display. " " icon on remote controller will be displayed.

Function Introduction for Combination Buttons

Child lock function

Press "+" and "-" buttons simultaneously can turn on or turn off child lock function.

When child lock function is started up, " " icon will be displayed on remote controller. If operate remote controller, " " icon will flash three times, while remote controller won't send signal.

Switchover function for temperature display

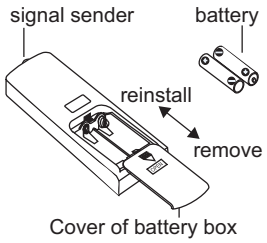
After turning off the unit by remote controller, press "-" button and "MODE" button simultaneously to switch between °C and °F .

Operation Guide

1. After putting through the power, press " ON/OFF " button on remote controller to turn on the air conditioner.
2. Press " MODE " button to select your required mode: AUTO, COOL, DRY, FAN, HEAT.
3. Press "+" or "-" button to set your required temperature. (Temperature can't be adjusted under auto mode).
4. Press " FAN " button to set your required fan speed: auto, low, medium and high speed.
5. Press " " and " " button to select fan blowing angle.

Replacement of Batteries in Remote Controller

1. Press the back side of remote controller marked with " ",as shown in the fig,and then push out the cover of battery box along the arrow direction.
2. Replace two 7# (AAA 1.5V) dry batteries, and make sure the position of "+" polar and "-" polar are correct.
3. Reinstall the cover of battery box.



Note:

● During operation, point the remote control signal sender at the receiving window on indoor unit.

● The distance between signal sender and receiving window should be no more than 8m, and there should be no obstacles between them.

● Signal may be interfered easily in the room where there is fluorescent lamp or wireless telephone; remote controller should be close to indoor unit during operation.

● Replace new batteries of the same model when replacement is required.

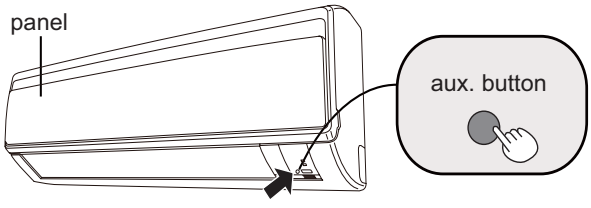
● When you don't use remote controller for a long time, please take out the batteries.

● If the display on remote controller is fuzzy or there's no display, please replace batteries.

Emergency Operation

If remote controller is lost or damaged, please use auxiliary button to turn on or turn off the air conditioner. The operation in details are as below:

As shown in the fig. press aux. button to turn on or turn off the air conditioner. When the air conditioner is turned on, it will operate under auto mode.



6.2 Brief Description of Modes and Functions

For 09、12K Unit

1.Temperature Parameters

●Indoor preset temperature (Tpreset)

●Indoor ambient temperature (Tamb.)

2. Basic Functions

Once energized, in no case should the compressor be restarted within less than 3 minutes. In the situation that memory function is available, for the first energization, if the compressor is at stop before de-energization, the compressor will be started without a 3-minute lag; if the compressor is in operation before de-energization, the compressor will be started with a 3-minute lag; and once started, the compressor will not be stopped within 6 minutes regardless of changes in room temperature;

(1)COOL mode

① The condition and process of cooling

If Tamb≥Tpreset COOL mode will act, the compressor and outdoor fan will run, and the indoor fan will run at the set speed.

If Tamb≤Tpreset-2°C, the compressor will stop, the outdoor fan will delay 30 seconds to stop, and the indoor fan will run at the set speed. If Tpreset-2°C≤Tamb ≤Tpreset , the unit will keep running in the previous mode. In this mode, the reversal valve will not be powered on and the temperature setting range is 16 ~30°C.

② Protection function

●Overcurrent protection

If total current is high, the compressor will run in limited frequency. If total current is too high, the compressor will stop, the outdoor fan will delay 30 seconds to stop, indoor unit will display E5 and outdoor yellow light will blink 5 times.

●Antifreezing protection

When the antifreezing protection is detected, the compressor will stop, the outdoor fan will stop after 30 seconds, and the indoor fan and swing motor will keep running in the original mode. When antifreezing protection is eliminated and the compressor has stopped for 3 minutes, the compressor will resume running in the original mode.

(2) Dehumidifying mode

① Working conditions and process of dehumidifying

If Tamb.>Tpreset, the unit will enter cooling and dehumidifying mode, in which case the compressor and the outdoor fan will operate and the indoor fan will run at low speed.

If Tpreset -2°C≤Tamb.≤Tpreset, the compressor remains at its original operation state.

If Tamb.< Tpreset -2°C, the compressor will stop, the outdoor fan will stop with a time lag of 30s, and the indoor fan will operate at low speed.

② Protection function

Protection is the same as that under the cooling mode.

(3) HEAT mode

① The condition and process of heating

If Tamb≤Tpreset+2°C, HEAT mode will act, the compressor, outdoor fan and reversal valve will run, the indoor fan will delay 3min to stop at the latest.

If Tpreset +2°C≤Tamb≤Tpreset +5°C,the unit will keep running in the original mode.

If Tamb≥Tpreset +5°C, the compressor will stop, the outdoor fan will delay 30sec to stop and indoor fan will blow 60S at low speed, the fan speed cannot be shifted within blow residual heat.

●In this mode, the temperature setting range is 16 ~30°C.

●The air conditioner will adjust the running frequency of the compressor automatically according to the change of ambient temperature.

●When the unit is turned off in HEAT mode, or switched to other mode from HEAT mode, the four-way valve will be powered off after the compressor stops.

② The condition and process of defrosting

When frost is detected in the condenser, the system will enter into defrosting state. When defrosting starts, the compressor and indoor fan will stop, and the outdoor fan and four-way valve will delay 30 seconds to stop. The compressor will start after 15 seconds and then defrosting will be started. When the compressor has run for 7 minutes or defrosting is finished, the compressor will stop. After 30 seconds the four-way valve opens and after another 60 seconds, the compressor and outdoor fan resume running. The indoor fan will delay 3 minutes to run at the latest and heating indicator on indoor unit OFF 0.5s and ON 10s.

③ Protection function

●Anti-cold-wind protection

In HEAT mode, in order to prevent the indoor unit from blowing out cold wind, each time the compressor starts, the indoor fan will delay 3 minutes after the compressor to run at the latest and it can adjust fan speed automatically when temperature is low.

●Overcurrent protection

Overcurrent protection is the same with that in COOL mode.

●Cold air prevention

The unit is started under heating mode (the compressor is ON):

1.In the case of Tindoor amb. <24°C: if T≤tube40°C and the indoor fan is at stop state, the indoor fan will begin to run at low speed with a time lag of 2 minutes. Within 2 minutes, if Ttube>40°C, the indoor fan also will run at low speed; and after1-minute operation at low speed, the indoor fan will be converted tooperation at preset speed. Within 1-minute low speed operation or 2-minute non-operation, if Ttube>42°C, the fan will run at present speed.
2.In the case of Tindoor amb.≥24°C: if Ttube≤42°C, the indoor fan will run at low speed, and afterone minute, the indoorfan will be converted to preset speed. Within one-minute low speed operation, if Ttube>42°C, the indoor fan will beconvertedto preset speed.
Note:$T_{indoor\ amb.}$ indicated in 1 and 2 refers to, under initially heating mode, the indoor ambient temperature before the command to start the compressor is performed according to the program, or after the unit is withdrawn from defrost, the indoor ambient temperature before the defrost symbol is cleared.
●Total current up and frequency down protection
If the total current I_{total}≤W, frequency rise will be allowed; if I_{total}≥X, frequency rise will not be allowed; if I_{total}≥Y, the compressor will run at reduced frequency; and if I_{total}≥Z, the compressor will stop and the outdoor fan will stop with a time lag of 30s.

(4) Fan Mode

Under the mode, the indoor fan will run at preset speed and the compressor, the outdoor fan, the four-way valve and the electric heater will stop.
Under the mode, temperature can be set within a range of 16 - 30°C.

(5) AUTO Mode

① The condition and process of auto
a. When Tamb.≥26°C the unit will operate at Cooling mode. In that case, the set temperature will be 25°C.
b. When Tamb.≤22°C the heat pump unit will operate at Heating mode. In that case, the set temperature will be 20°C; the cooling-only unit will operate at Fan mode and the set temperature will be 25°C.
c. When 23°C≤Tamb.≤25°C the unit will keep its operation status but if it is firstly energized, the unit will operate at Fan mode.
d. When unit operates at Auto mode, the frequency of compressor will be the same as that in Cooling mode if the unit is coolingwhile it will be the same as that in the Heating mode if the unit is heating.
② Protection function
a.In cooling operation, protection is the same as that under the cooling mode;
b.In heating operation, protection is the same as that under the heating mode;
c.When ambient temperature changes, operation mode will be converted preferentially. Once started, the compressor will remain unchanged for at least 6 minutes.

(6) Common Protection Functions and Fault Display under COOL, HEAT, DRY and AUTO Modes

① Overload protection
Ttube: measured temperature of outdoor heat exchanger under cooling mode; and measured temperature of indoor heat exchanger under heating mode.
1) Cooling overload
a. If T tube52, the unit will return to its original operation state.
b. If T tube55, frequency rise is not allowed.
c. If T tube58, the compressor will run at reduced frequency.
d. If T tube62, the compressor will stop and the indoor fan will run at preset speed.
2) Heating overload
a. If T tube52, the unit will return to its original operation state.
b. If T tube55, frequency rise is not allowed.
c. If T tube58, the compressor will run at reduced frequency.
d. If T tube62, the compressor will stop and the indoor fan will blow residue heat and then stop.
② Exhaust temperature protection of compressor
If exhaust temperature 98, frequency is not allowed to rise.
If exhaust temperature 103, the compressor will run at reduced frequency.
If exhaust temperature 110, the compressor will stop.
If exhaust temperature 90 and the compressor has stayed at stop for at least 3 minutes, the compressor will resume its operation.
③ Communication fault
If the unit fails to receive correct signals for durative 3 minutes, communication fault can be justified and the whole system will stop.
④ Module protection
Under module protection mode, the compressor will stop. When the compressor remains at stop for at least 3 minutes, the compressor will resume its operation. If module protection occurs six times in succession, the compressor will not be started again.
⑤ Overload protection
If temperature sensed by the overload sensor is over 115, the compressor will stop and the outdoor fan will stop with a time lag of 30 seconds.
⑥ If temperature is below 95, the overload protection will be relieved. If voltage on the DC bus is below 150V or over 420V, the compressor will stop and the outdoor fan will stop with a time lag of 30 seconds. When voltage on the DC bus returns to its normal value and the compressor has stayed at stop for at least 3 minutes, the compressor will resume its operation.

3. Other Controls

(1) ON/OFF

Press the remote button ON/OFF: the on-off state will be changed once each time you press the button.

(2) Mode Selection

Press the remote button MODE, then select and show in the following ways: AUTO, COOL, DRY, FAN, HEAT, AUTO.

(3) Temperature Setting Option Button

Each time you press the remote button TEMP+ or TEMP-, the setting temperature will be up or down by 1°C. Regulating Range: 16~30°C, the button is useless under the AUTO mode.

(4) Time Switch

You should start and stop the machine according to the setting time by remote control.

(5) SLEEP State Control

① Cooling mode

a. When initial temperature setting is 16~23°C, after turning on sleep function, temperature will increase 1°C every one hour. After temperature is increased by 3°C, the unit will keep this temperature. After operation for 7 hours, temperature will decrease 1°C. After that, the unit will operate at this temperature all the time.

b. When initial temperature setting is 24~27°C, after turning on sleep function, temperature will increase 1°C every one hour. After temperature is increased by 2°C, the unit will keep this temperature. After operation for 7 hours, temperature will decrease 1°C. After that, the unit will operate at this temperature all the time.

c. When initial temperature setting is 28~29°C, after turning on sleep function, temperature will increase 1°C every one hour. After temperature is increased by 1°C, the unit will keep this temperature. After operation for 7 hours, temperature will decrease 1°C. After that, the unit will operate at this temperature all the time. When the initial temperature setting is 30°C, the unit will operate under this temperature. After operation for 7 hours, temperature will decrease 1°C. After that, the unit will operate at this temperature all the time.

② Heating mode:

a. When initial temperature setting is 16°C, the unit operate under this temperature all the time.

b. When initial temperature setting is 17~20°C, after turning on sleep function, temperature will decrease 1°C every one hour. After temperature is increased by 1°C, the unit will keep this temperature.

c. When initial temperature setting is 21~27°C, after turning on sleep function, temperature will decrease 1°C every one hour. After temperature is increased by 2°C, the unit will keep this temperature.

d. When initial temperature setting is 28~30°C, after turning on sleep function, temperature will decrease 1°C every one hour. After temperature is increased by 3°C, the unit will keep this temperature.

(6) Indoor Fan Control

Speed of indoor fan can be set as Turbo, High, Med., Low by remote control. In that case, fan will operate at super high, high, medium, or low speed accordingly. The fan speed can also be set at Auto, which is as follows:

① In heating mode: in auto heating or heating mode, the auto fan speed is as follows:

a. Tamb.≤Tpreset+1°C: indoor fan will operate at high speed;

b. Tpreset+1°C<Tamb.<Tpreset + 3°C: indoor fan will operate at med. speed;

c. Tamb.≥Tpreset + 3°C: indoor fan will operate at low speed; At least 210 seconds of operation shall be maintained for switchover between high and low speeds, med. and low speeds, and high and low speeds.

② In cooling mode, in auto cooling or cooling mode, the auto fan speed is as follows:

a. Tamb.≥Tpreset+2°C: indoor fan will operate at high speed.

b. Tpreset <Tamb.<Tpreset + 2°C: indoor fan will operate at med. speed;

c. Tamb.≤Tpreset: indoor fan will operate at low speed. At least 210 seconds of operation shall be maintained for switchover between high and low speeds, med. and low speeds, and high and low speeds.

(7) Buzzer Control

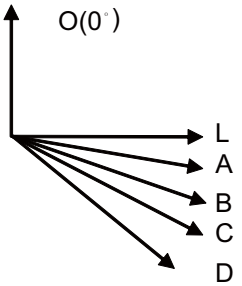
The buzzer will send a “Di” sound when the air conditioner is powered up or received the information sent by the remote control or there is a button input, the single tube cooler doesnt receive the remote control ON signal under the mode of heating mode.

(8) Auto button

If the controller is on, it will stop by pressing the button, and if the controller is off, it will be automatic running state by pressing the button, swing on and light on, and the main unit will run based on the remote control if there is remote control order.

(9) Up-and-Down Swinging Control

When power on, the up-and-down motor will firstly move the air deflector to o counter-clockwise, close the air outlet. After starting the machine, if you dont set the swinging function, heating mode and auto-heating mode, the up-and-down air deflector will move to D clockwise; under other modes, the up-and-down air deflector will move to L1. If you set the swinging function when you start the machine, then the wind blade will swing between L and D. The air deflector has 7 swinging states: Location L, Location A, Location B, Location C, Location D, Location L to Location D, stop at any location between L-D (the included angle between L~D is the same). The air deflector will be closed at 0 Location, and the swinging is effectual only on condition that setting the swinging order and the



inner fan is running. The indoor fan and compressor may get the power when air deflector is on the default location.

(10) Display(NOTE:Nixie tube is not available for A8 panel.)

① Operation pattern and mode pattern display

All the display patterns will display for a time when the power on, the operation indication pattern will display in red under standby status. When the machine is start by remote control, the indication pattern will light and display the current operation mode (the mode light includes: Cooling, heating and dehumidify). If you close the light key, all the display patterns will close.

② Double-8 display

According to the different setting of remote control, the nixie light may display the current temperature (the temperature scope is from 16 to 30°C) and indoor ambient temperature. The heating and air supply temperature will display 25°C under auto-mode, the temperature will display 20°C under the heating mode, and under defrosting status, heating indicator on indoor unit OFF 0.5s and ON 10s.(If you set the fahrenheit temperature display, the nixie light will display according to fahrenheit temperature)

(11) Protection function and failure display

E2: Freeze-proofing protection E4: Exhausting protection E5: Overcurrent protection E6: Communication failure

F1: Indoor ambient sensor start and short circuit (continuously measured failure in 5S)

F2: Indoor evaporator sensor start and short circuit (continuously measured failure in 5S)

F3: Outdoor ambient sensor start and short circuit (continuously measured failure in 30S)

F4: Outdoor condenser sensor start and short circuit (continuously measured failure in 30S, and dont measure within 10 minutes after defrosted)

F5: Outdoor exhausting sensor start and short circuit (continuously measured failure in 30S after the compressor operated 3 minutes)

H3: Overload protection of compressor H5: Module protection PH: High-voltage protection PL: Low-voltage protection

P1: Nominal cooling and heating P2: Maximum cooling and heating P3: Medium cooling and heating

P0: Minimum cooling and heating

(12) Drying Function

You may start or stop the drying function under the modes of cooling and dehumidify at the starting status (The modes of automatism, heating and air supply do not have drying function). When you start the drying function, after stop the machine by pressing the switch button, you should keep running the inner fans for 2 minutes under low air damper (The swing will operate as the least status within 2 minutes, and other load is stopped), then stop the entire machine;When you stop the drying function, press the switch button will stop the machine directly.

When you start the drying function, operating the drying button wi

(13) Memory Function

When interrupting the power supply memory content: mode, swing function, light, set temperature and wind speed.After interrupted the power supply, the machine will start when recovering the power according to the memory contentautomatically.ll stop the inner fans and close the guide louver.

Outdoor Part

1. Input Parameter Compensation and Calibration

① **Check the input parameter compensation function**

As the instruction feature of split unit, concerning the comfortable, in heating mode, the indoor ambient temperature of compressor stopping time is higher than preset temperature.

② **Check effective judgment controls of parameters**

Effective judgment function of the outdoor exhaust temperature thermo-bulb

When conditions a and b are satisfied, the outdoor exhaust temperature thermo-bulb is judged not to be connected into place, the mainboard of outer units will display failure of the outdoor exhaust temperature thermo-bulb (not connected into place), stop the unit for repairing, and resume it by remote controls of ON/OFF.

2. Basic Functions

(1) Cooling Mode

① Conditions and processes of cooling operation:

a) If the compressor is stop, and $[T_{preset} - (T_{indoor\ ambient} - \Delta T_{cooling\ indoor\ ambient\ temperature\ compensation})] \leq 0.5°C$, start up the unit for cooling, and start to cooling operation;

b) During operations of cooling, if $0°C \leq [T_{preset} - (T_{indoor\ ambient} - \Delta T_{cooling\ indoor\ ambient\ temperature\ compensation})] < 2°C$, the cooling operation will be still running;

c) During operations of cooling, if $2°C \leq [T_{preset} - (T_{indoor\ ambient} - \Delta T_{cooling\ indoor\ ambient\ temperature\ compensation})]$, the cooling operation will stop after reaching to the temperature point.

② Temperature setting range

a) If $T_{outdoor\ ambient} \geq [T_{low\text{-}temperature\ cooling}]$, the temperature can be set at: 16~30°C (Cooling at room temperature);

b) If $T_{outdoor\ ambient} < [T_{low\text{-}temperature\ cooling}]$, the temperature can be set at: 25~30°C (Cooling at low temperature), that is, the minimum setting temperature for outdoor unit judgment is 25°C.

(2) Dry Mode

① Conditions and processes of dry operations: Same as the cooling mode;

② The temperature setting range is: 16~30°C;

(3) Fan Mode

1. The compressor, outdoor fan and four-way valve are switched off;

② The temperature setting range is: 16~30°C.

(4) Heating Mode

① Conditions and processes of heating operations: ($T_{indoor\ ambient}$ is the actual detection temperature of indoor environment thermo-bulb, $\Delta T_{heating\ indoor\ ambient\ temperature\ compensation}$ is the indoor ambient temperature compensation during heating operations)

a) If the compressor is stop, and $[(T_{indoor\ ambient} - \Delta T_{heating\ indoor\ ambient\ temperature\ compensation}) - T_{preset}] \leq 0.5°C$, start the machine to enter into heating operations for heating;

b) During operations of heating, if $0°C \leq [(T_{indoor\ ambient} - \Delta T_{heating\ indoor\ ambient\ temperature\ compensation}) - T_{preset}] < 2°C$, the heating operation will be still running;

c) During operations of heating, if $2°C \leq [(T_{indoor\ ambient} - \Delta T_{heating\ indoor\ ambient\ temperature\ compensation}) - T_{preset}]$, the heating operation will stop after reaching the temperature point.

② The temperature setting range in this mode is: 16~30°C.

(5) Defrosting Control

① After the time for defrosting is judged to be satisfied, if the temperature for defrosting is satisfied after detections for continuous 3minutes, the defrosting operation will start.

② Start to defrost: Compressor stops and starts up 55S later;

③ Defrosting fi nish: Compressor stops and starts up 55S later;

④ Conditions of fi nishing defrosting

The defrosting operation can exit when any of the conditions below is satisfied:

a) $T_{outdoor\ pipe} \geq 12°C$;

b) $T_{outdoor\ ambient} < -5°C$, and the Toutdoor pipe≥ 6°C last more than 80S;

c) The continuous running time of defrosting reaches to 8min.

(6) Compressor Control

① The frequency of compressor will be controlled with the relationship of ambient temperature and preset temperature and changing speed of ambient temperature;
② Start the compressor after starting cooling, heating, dry operations, and the outdoor fan start for 5s;
③ When the unit is off, in safety stops and switching to fan mode, the compressor will stop immediately;
④ In all modes: once the compressor starts up, it will not be allowed to stop until having run for the [$T_{min.\ Compressor\ running\ time}$] (Note: including cases of shutdown when the temperature point is reached; except the cases requiring stopping the compressor such as fault protection,remote shutdown, mode switching etc.);
⑤ In all modes: once the compressor stops, it will be allowed be restart after 3-minute delay (Note: The indoor units have a function of power memory, the machine can be restarted after remote shutdown and powering up again without delay).

(7) Outdoor Fan Control

① When the unit is off by remote control, in safety stops and stop after reaching to the temperature point.
② In fan mode: The outdoor fan stops;
③ Start to defrost: Outdoor fan will stop after compressor stops for 50S;
④ Defrosting fi nish: Outdoor fan will start up when the compressor is stopping.

(8) 4-way valve control

① The 4-way valve control under the modes of Cooling, dehumidifi cation and fan: closing;
② When the unit is on in heating mode, the 4-way valve is energized;
③ When the unit is on in heating mode and heating mode shift to other modes, the 4-way valve will be de-energized after compressor stops for 2min;
④ After protection stops, the 4-way valve will be de-energized after 4min;
⑤ Start to defrost: The power of 4-way valve will be de-energized after the compressor stops;
⑥ Defrosting finish: The 4-way valve will be energized after the compressor stops.

(9)Freeze prevention protection

① Under cooling or drying mode, if it detected that Tindoor tube <0°C for 3 min successively, the unit will stop operation due to freeze prevention protection. If 6°C<Tindoorr tube, and compressor has stopped for 3min, the complete unit can be allowed to resume operation;
② Under cooling or drying mode, if Tindoor tube<6°C, the operation frequency of compressor may decrease or the operation frequency of compressor may stop increasing,
③ If the unit stops operation due to freeze prevention protection for 6 times successively, the unit cant resume operation automatically and error code will be displayed successively. Only press ON/OFF button can resume the operation. During operation process, if compressor operates for more than 10min, times of stop operation due to freeze prevention protection will be cleared.
Malfunction and malfunction times will be cleared immediately when turning off the unit or switch to fan/heating mode.

(10)Overload protection function

①Overload protection function under cooling or drying mode, if 65°C≤Toutdoor tube, the unit stops operation due to overload protection under cooling; if Toutdoor tube<55°C, and compressor has stopped for 3mins, the complete unit can then be allowed to resume operation;
② under cooling or drying mode, if 55°C≤Toutdoor tube, operation frequency of compressor will decrease or operation frequency of compressor will stop increasing;
③ Overload protection function under heating mode, if 64°C≤Tindoor tube, the unit will stop operation due to overload protection under heating, If Tindoor tube<54°C, and compressor has stopped for 3min, the complete unit can then be allowed to resume operation;
④ Under heating mode, if 54°C≤Tindoor tube, operation frequency of compressor will decrease or operation frequency of compressor will stop increasing;
⑤ If the unit stops operation due to overload protection for 6 times successively, the unit cant resume operation automatically and error code will be displayed successively. Only press ON/OFF button can resume the operation. During operation process, if compressor operates for more than 10min, times of stop operation due to overload protection will be cleared. Malfunction and malfunction times will be cleared immediately when turning off the unit, under fan mode or switching to heating mode.

(11)Discharge temperature protection function of compressor

① If 115°C≤Tdischarge, the unit stops operation due to discharge protection; if Tdischarge<97°C, and compressor has stopped for 3min,the complete unit can then be allowed to resume operation;
② If 97°C≤Tdischarge, operation frequency of compressor will decrease or operation frequency of compressor will stop increasing;
③ If the unit stops operation due to discharge temperature protection of compressor for 6 times successively, the unit cant resume

operation automatically and error code will be displayed successively. Only press ON/OFF button can resume the operation. During operation process, if compressor operates for more than 10min, times of stop operation due to discharge protection will be cleared. Malfunction and malfunction times will be cleared immediately when turning off the unit, or switching to fan mode.

(12)Current protection function

① If 12A ≤ I AC current, operation frequency of compressor will decrease or operation frequency of compressor will stop increasing;

② If 17 A ≤ I AC current, the unit stops operation due to overcurrent protection. When compressor has stopped operation for 3min, the complete unit can then be allowed to resume operation.

③ If the unit stops operation due to overcurrent protection for 6 times successively, the unit cant resume operation automatically. Only press ON/OFF button can resume the operation. During operation process, if compressor operates for more than 10min, times of stop operation due to overcurrent protection will be cleared.

(13)Voltage-dropping protection

During operation, if the voltage is decreasing quickly, the unit may stop operation and alarm voltage-dropping malfunction. 3 mins later, the unit will be restarted up automatically.

(14)Communication malfunction

If it hasnt received the correct signal from indoor unit for 3min successively, the unit will stop operation due to communication malfunction; If communication malfunction is resumed and compressor has stopped for 3min, the complete unit can then be allowed to resume operation.

(15)IPM module protection

After compressor is turned on, if it causes overcurrent to IPM modular, or control voltage is too low due to some abnormal causes, IP will generate modular protection signal. Main chip will detect the modular protection signal as soon as the unit is turned on. Once modular protection signal is detected, the unit will stop operation immediately due to protection. If modular protection is resumed and compressor has stopped for 3min, the complete unit can then be allowed to resume operation.

If the unit stops operation due to modular protection for 3 times successively, the unit cant resume operation automatically, except pressing ON/OFF button. If compressor has operates for more than 10 min successively, the stop operation times due to modular protection will be cleared.

(16)Modular overheating protection

① If 80°C≤Tmodular, operation frequency of compressor will decrease or operation frequency of compressor will stop increasing;

② If 95°C≤Tmodular, the unit will stop operation due to protection; if Tmodular<87°C, and compressor has stopped for 3min, the complete unit can then be resume operation;

③ If the unit stops operation due to modular overheating protection for 6 times successively, the unit cant resume operation automatically. Only press ON/OFF button can resume the operation. During operation process, if compressor operates for more than 10min, times of stop operation due to modular overheating protection will be cleared. Malfunction times will be cleared immediately when turning off the unit, or switching to fan mode.

(17)Overload protection of compressor

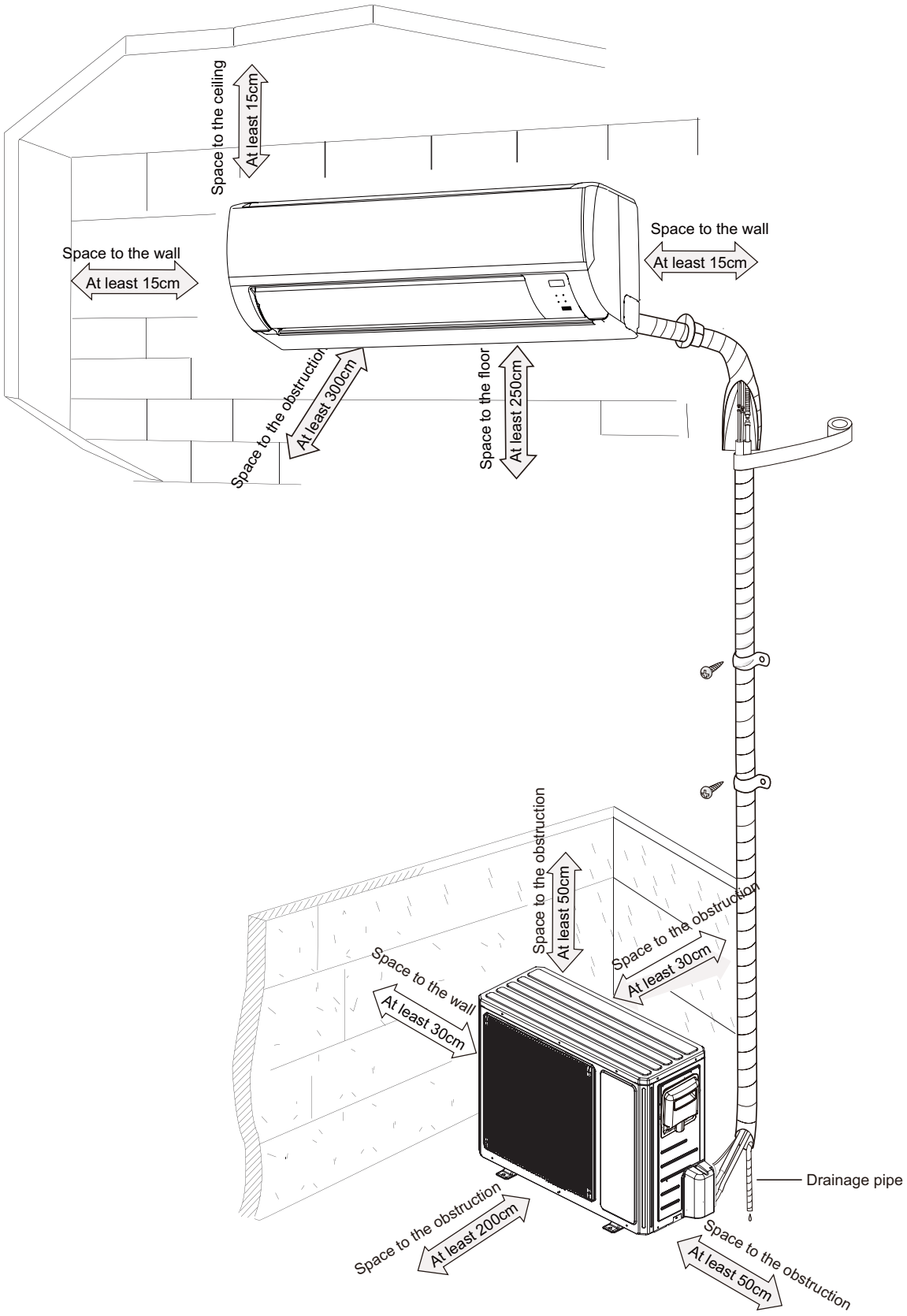
① If it detected that overload switch of compressor breaks for 3s successively, the system will stop operation due to protection;

② If it detected overload protection is resumed, and compressor has stopped for 3min, the complete unit can then be allowed to resume operation;

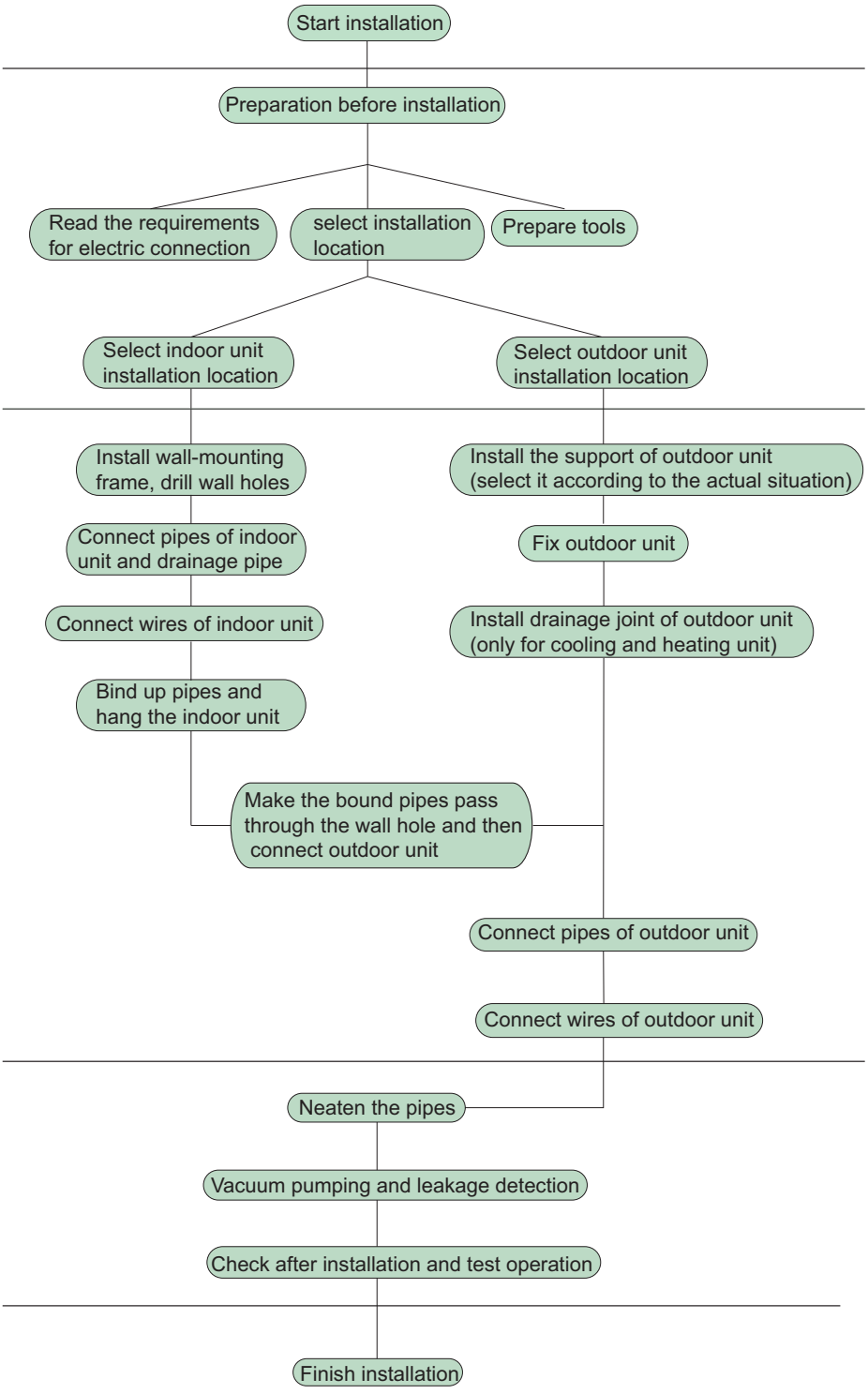
③ If it detected that the unit stops operation due to overload protection of compressor for 3 times successively, the unit cant resume operation automatically, except pressing ON/OFF button. After compressor operates for 30min, overload protection times of compressor will be cleared.

8. Installation

8.1 Installation Dimension Diagram



Installation procedures


Start installation
Preparation before installation
Read the requirements for electric connection
select installation location
Prepare tools
Select indoor unit installation location
Select outdoor unit installation location
Install wall-mounting frame, drill wall holes
Install the support of outdoor unit (select it according to the actual situation)
Connect pipes of indoor unit and drainage pipe
Fix outdoor unit
Connect wires of indoor unit
Install drainage joint of outdoor unit (only for cooling and heating unit)
Bind up pipes and hang the indoor unit
Make the bound pipes pass through the wall hole and then connect outdoor unit
Connect pipes of outdoor unit
Connect wires of outdoor unit
Neaten the pipes
Vacuum pumping and leakage detection
Check after installation and test operation
Finish installation

Note: this flow is only for reference; please find the more detailed installation steps in this section.

8.2 Installation Parts-checking

No.	Name	No.	Name
1	Indoor unit	8	Sealing gum
2	Outdoor unit	9	Wrapping tape
3	Connection pipe	10	Support of outdoor unit
4	Drainage pipe	11	Fixing screw
5	Wall-mounting frame	12	Drainage plug(cooling and heating unit)
6	Connecting cable(power cord)	13	Owner's manual, remote controller
7	Wall pipe		

⚠ **Note:**
1.Please contact the local agent for installation.
2.Don't use unqualified power cord.

8.3 Selection of Installation Location

1. Basic Requirement:
Installing the unit in the following places may cause malfunction. If it is unavoidable, please consult the local dealer:
(1) The place with strong heat sources, vapors, flammable or explosive gas, or volatile objects spread in the air.
(2) The place with high-frequency devices (such as welding machine, medical equipment).
(3) The place near coast area.
(4) The place with oil or fumes in the air. in the air.
(5) The place with sulfureted gas.
(6) Other places with special circumstances.

2. Indoor Unit:
(1) There should be no obstruction near air inlet and air outlet.
(2) Select a location where the condensation water can be dispersed easily and won't affect other people.
(3) Select a location which is convenient to connect the outdoor unit and near the power socket.
(4) Select a location which is out of reach for children.
(5) The location should be able to withstand the weight of indoor unit and won't increase noise and vibration.
(6) The height of indoor unit should be between 250 cm from the floor in order to provide sufficient space for maintenance.
(7) Don't install the indoor unit right above the electric appliance.
(8) The appliance shall not be installed in the laundry

3. Outdoor unit:
1.Select a location where the noise and outflow air emitted by the outdoor unit will not affect neighborhood.
2.The location should be well ventilated and dry, in which the outdoor unit won't be exposed directly to sunlight or strong wind.
3.The location should be able to withstand the weight of outdoor unit.
4.Make sure that the installation follows the requirement of installation dimension diagram.
5.Select a location which is out of reach for children and far away from animals or plants.If it is unavoidable, please add fence for safety purpose.

8.4 Electric Connection Requirement

1. Safety precaution
(1) Must follow the electric safety regulations when installing the unit.
(2) According to the local safety regulations, use qualified power supply circuit and air switch.
(3) Make sure the power supply matches with the requirement of air conditioner. Unstable power supply or incorrect wiring may result in electric shock,fire hazard or malfunction. Please install proper power supply cables before using the air conditioner.

Air-conditioner	Air switch capacity
All models	16A

(4) Properly connect the live wire, neutral wire and grounding wire of power socket.
(5) Be sure to cut off the power supply before proceeding any work related to electricity and safety.
(6) Do not put through the power before finishing installation.
(7) For appliances with type Y attachment,the instructions shall contain the substance of thefollowing.If the supply cord is damaged,it must be replaced by the manufacturer,its service agent or similarly qualified persons in order to avoid a hazard.
(8) The temperature of refrigerant circuit will be high, please keep the interconnection cable away from the copper tube.

2. Grounding requirement:
(1) The air conditioner is first class electric appliance. It must be properly grounding with specialized grounding device by a professional. Please make sure it is always grounded effectively, otherwise it may cause electric shock.
(2) The yellow-green wire in air conditioner is grounding wire, which can't be used for other purposes.
(3) The grounding resistance should comply with national electric safety regulations.
(4) The appliance must be positioned so that the plug is accessible
(5) An all-pole disconnection switch having a contact separation of at least 3mm in all poles should be connected in fixed wiring.
(6) Including an air switch with suitable capacity, please note the following table. Air switch should be included magnet buckle and heating buckle function, it can protect the circuit-short and overload. (Caution: please do not use the fuse only for protect the circuit)

8.5 Installation of Indoor Unit

1. Choosing Installation location
Recommend the installation location to the client and then confirm it with the client.

2. Install Wall-mounting Frame
(1) Hang the wall-mounting frame on the wall; adjust it in horizontal position with the level meter and then point out the screw fixing holes on the wall.
(2) Drill the screw fixing holes on the wall with impact drill (the specification of drill head should be the same as the plastic expansion particle) and then fill the plastic expansion particles

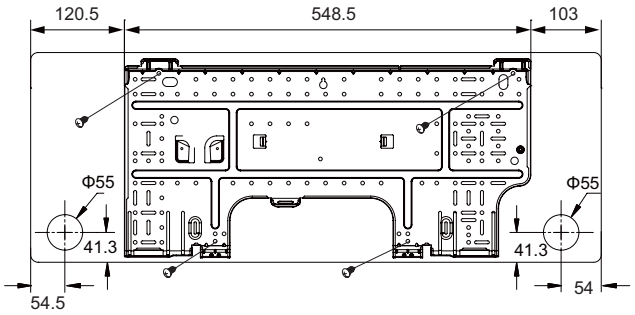
in the holes.

(3) Fix the wall-mounting frame on the wall with tapping screws (ST4.2X25TA) and then check if the frame is firmly installed by pulling the frame. If the plastic expansion particle is loose, please drill another fixing hole nearby.

3. Install Wall-mounting Frame

(1) Choose the position of piping hole according to the direction of outlet pipe. The position of piping hole should be a little lower than the wall-mounted frame.(As show in Fig.1)

09&12K:



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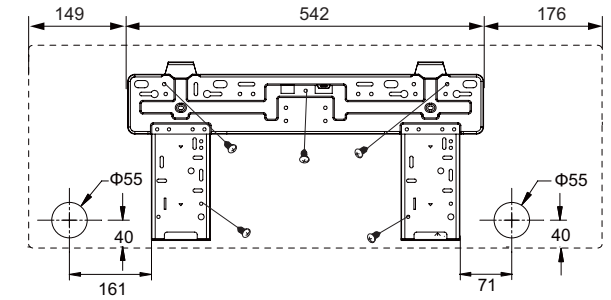

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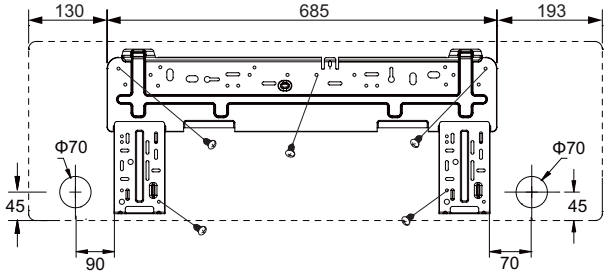


Fig.1

(2) Open a piping hole with the diameter 50 or 70 on the selected outlet pipe position.In order to drain smoothly, slant the piping hole on the wall slightly downward to the outdoor side with the gradient of 5-10°.(As show in Fig.2)

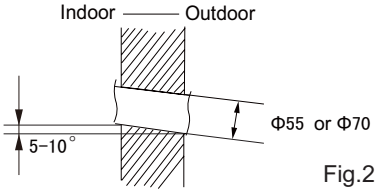


Fig.2

⚠ **Note:**

(1) Pay attention to dust prevention and take relevant safety measures when opening the hole.

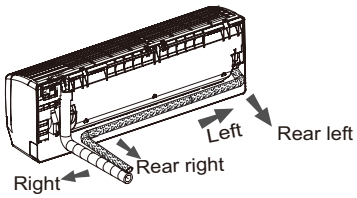
(2) The plastic expansion particles are not provided and should be bought locally.

4. Outlet pipe

(1) The pipe can be led out in the direction of right, rear right, left or rear left.(As show in Fig.3)

(2) When selecting leading out the pipe from left or right, please cut off the corresponding hole on the bottom case.(As show in Fig.4)

Fig.3



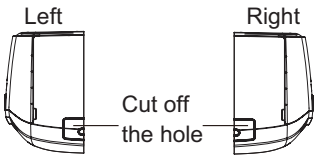


Fig.4

5. Connect the pipe of indoor unit

(1) Aim the pipe joint at the corresponding bellmouth.(As show in Fig.5)

(2) Pretightening the union nut with hand.

(3) Adjust the torque force by referring to the following sheet. Place the open-end wrench on the pipe joint and place the torque wrench on the union nut. Tighten the union nut with torque wrench.(As show in Fig.6)

(4) Wrap the indoor pipe and joint of connection pipe with insulating pipe, and then wrap it with tape.(As show in Fig.7)

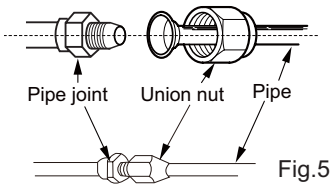


Fig.5

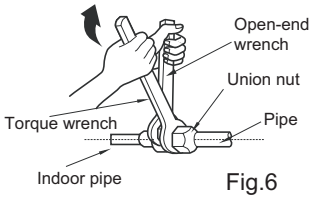


Fig.6

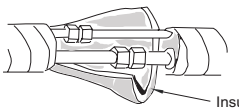


Fig.7

Refer to the following table for wrench moment of force:

Hex nut diameter(mm)	Tightening torque(N.m)
Φ6	15~20
Φ9.52	30~40
Φ12	45~55
Φ16	60~65
Φ19	70~75

6. Install Drain Hose

(1) Connect the drain hose to the outlet pipe of indoor unit.(As show in Fig.8)

(2) Bind the joint with tape.(As show in Fig.9)

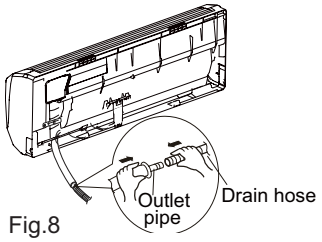


Fig.8

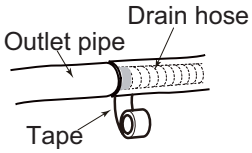


Fig.9

⚠ **Note:**

(1) Add insulating pipe in the indoor drain hose in order to prevent condensation.
(2) The plastic expansion particles are not provided.
(As show in Fig.10)

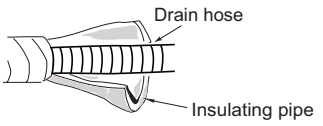


Fig.10

7. Connect Wire of Indoor Unit

(1) Open the panel, remove the screw on the wiring cover and then take down the cover.(As show in Fig.11)

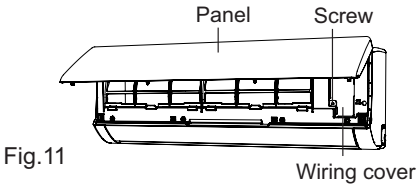


Fig.11

(2) Make the power connection wire go through the cable-cross hole at the back of indoor unit and then pull it out from the front side.(As show in Fig.12)

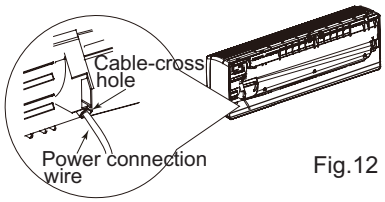


Fig.12

(3) Remove the wire clip; connect the power connection wire to the wiring terminal according to the color; tighten the screw and then fix the power connection wire with wire clip.(As show in Fig.13)

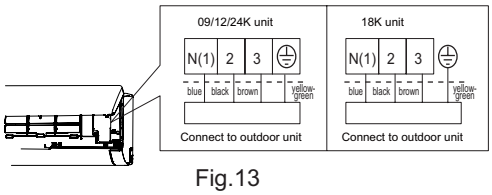


Fig.13

(4) Put wiring cover back and then tighten the screw.
(5) Close the panel.

⚠ **Note:**

(1) All wires of indoor unit and outdoor unit should be connected by a professional.
(2) If the length of power connection wire is insufficient, please contact the supplier for a new one. Avoid extending the wire by yourself.
(3) For the air conditioner with plug, the plug should be reachable after finishing installation.
(4) For the air conditioner without plug, an air switch must be installed in the line. The air switch should be all-pole parting and the contact parting distance should be more than 3mm.

8. Bind up pipe

(1) Bind up the connection pipe, power cord and drain hose with the band.(As show in Fig.14)
(2) Reserve a certain length of drain hose and power cord for installation when binding them. When binding to a certain degree, separate the indoor power and then separate the drain hose.(As show in Fig.15)
(3) Bind them evenly.
(4) The liquid pipe and gas pipe should be bound separately at the end.

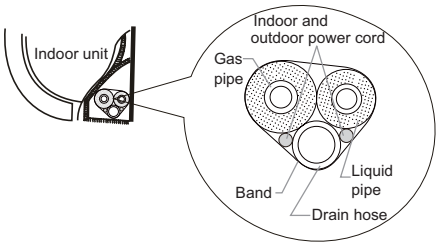


Fig.14

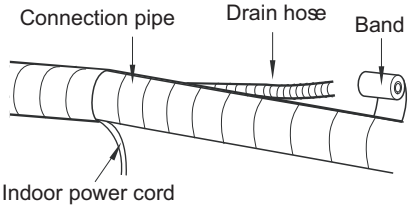


Fig.15

⚠ **Note:**

(1) The power cord and control wire can't be crossed or winding.
(2) The drain hose should be bound at the bottom.

9. Hang the indoor unit

(1) Put the bound pipes in the wall pipe and then make them pass through the wall hole.
(2) Hang the indoor unit on the wall-mounting frame.
(3) Stuff the gap between pipes and wall hole with sealing gum.
(4) Fix the wall pipe.
(As show in Fig.16)
(5) Check if the indoor unit is installed firmly and closed to the wall.(As show in Fig.17)

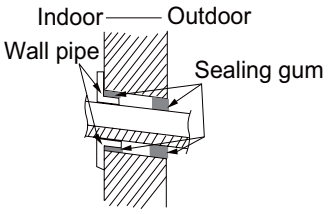
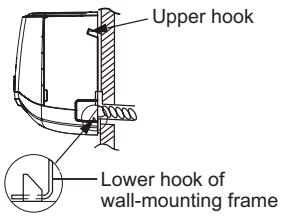


Fig.16

Fig.17



⚠ **Note:**

Do not bend the drain hose too excessively in order to prevent blocking.

8.6 Installation of Outdoor Unit

1. Fix the support of outdoor unit(select it according to the actual installation situation)

(1) Select installation location according to the house structure.
(2) Fix the support of outdoor unit on the selected location with expansion screws.

⚠ **Note:**

(1) Take sufficient protective measures when installing the outdoor unit.
(2) Make sure the support can withstand at least four times the unit weight.
(3) The outdoor unit should be installed at least 3cm above the floor in order to install drain joint.(As show in Fig.18)
(4) For the unit with cooling capacity of 2300W~5000W, 6 expansion screws are needed; for the unit with cooling capacity of 6000W~8000W, 8 expansion screws are needed; for the unit with cooling capacity of 10000W~16000W, 10 expansion screws are needed.

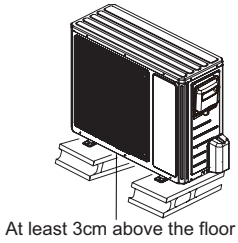


Fig.18

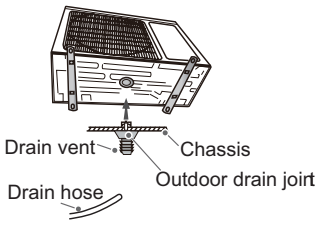


Fig.19

2. Install drain joint(only for cooling and heating unit)

(1) Connect the outdoor drain joint into the hole on the chassis.
(2) Connect the drain hose into the drain vent.
(As show in Fig.19)

3. Fix outdoor unit

(1) Place the outdoor unit on the support.
(2) Fix the foot holes of outdoor unit with bolts.
(As show in Fig.20)

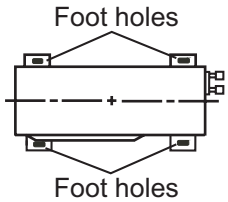


Fig.20

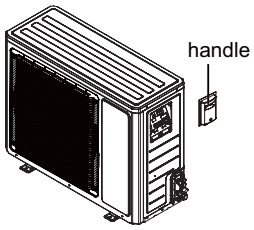


Fig.21

4. Fix outdoor unit

(1) Remove the screw on the right handle of outdoor unit and then remove the handle.(As show in Fig.21)
(2) Remove the screw cap of valve and aim the pipe joint at the bellmouth of pipe.(As show in Fig.22)

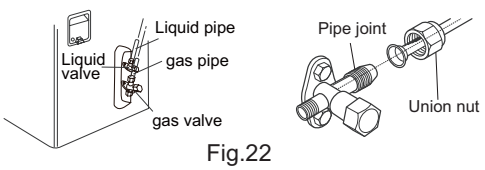


Fig.22

(3) Pretightening the union nut with hand.
(4) Tighten the union nut with torque wrench .

Refer to the following table for wrench moment of force:

Hex nut diameter(mm)	Tightening torque(N.m)
Φ6	15~20
Φ9.52	30~40
Φ12	45~55
Φ16	60~65
Φ19	70~75

5. Connect outdoor electric wire

(1) Remove the wire clip; connect the power connection wire to the wiring terminal according to the color; fix them with screws. (As show in Fig.23)

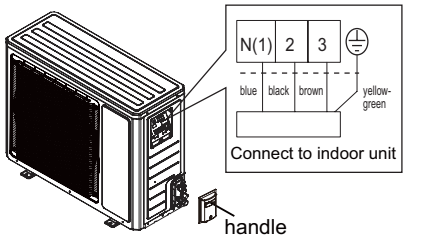


Fig.23

(2) Fix the power connection wire wire with wire clip.

⚠ **Note:**

(1) After tightening the screw, pull the power cord slightly to check if it is firm.
(2) Never cut the power connection wire to prolong or shorten the distance.

6. Neaten the pipes

(1) The pipes should be placed along the wall, bent reasonably and hidden possibly. Min. semidiameter of bending the pipe is 10cm.
(2) If the outdoor unit is higher than the wall hole, you must set a U-shaped curve in the pipe before pipe goes into the room, in order to prevent rain from getting into the room.(As show in Fig.24)

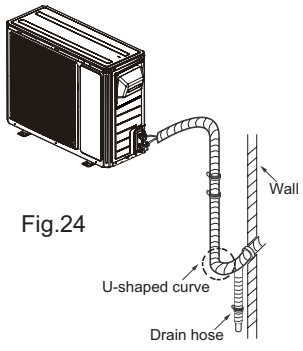


Fig.24

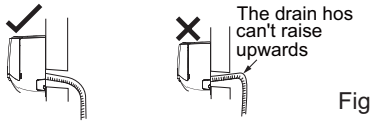


Fig.25

⚠ **Note:**

(1) The through-wall height of drain hose shouldn't be higher than the outlet pipe hole of indoor unit.(As show in Fig.25)
(2) Slant the drain hose slightly downwards. The drain hose can't be curved, raised and fluctuant, etc.(As show in Fig.26)

(3) The water outlet can't be placed in water in order to drain smoothly.(As show in Fig.27)

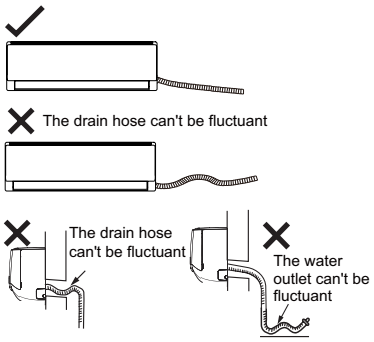


Fig.26

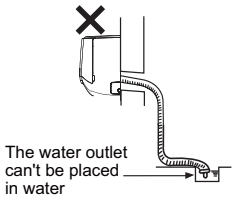


Fig.27

8.7 Vacuum Pumping and Leak Detection

1. Use vacuum pump

(1) Remove the valve caps on the liquid valve and gas valve and the nut of refrigerant charging vent.

(2) Connect the charging hose of piezometer to the refrigerant charging vent of gas valve and then connect the other charging hose to the vacuum pump.

(3) Open the piezometer completely and operate for 10-15min to check if the pressure of piezometer remains in -0.1MPa.

(4) Close the vacuum pump and maintain this status for 1-2min to check if the pressure of piezometer remains in -0.1MPa. If the pressure decreases, there may be leakage.

(5) Remove the piezometer, open the valve core of liquid valve and gas valve completely with inner hexagon spanner.

(6) Tighten the screw caps of valves and refrigerant charging vent.

(As show in Fig.28)

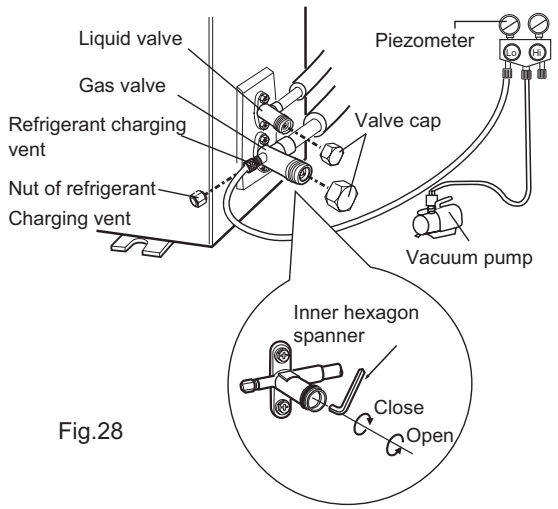


Fig.28

2. Leakage detection

(1) With leakage detector:

Check if there is leakage with leakage detector.

(2) With soap water:

If leakage detector is not available, please use soap water for leakage detection. Apply soap water at the suspected position and keep the soap water for more than 3min. If there are air bubbles coming out of this position, there's a leakage.

8.8 Check after Installation and Test Operation

1. Check after installation

Check according to the following requirement after finishing installation.

NO.	Items to be checked	Possible malfunction
1	Has the unit been installed firmly?	The unit may drop, shake or emit noise.
2	Have you done the refrigerant leakage test?	It may cause insufficient cooling (heating) capacity.
3	Is heat insulation of pipeline sufficient?	It may cause condensation and water dripping.
4	Is water drained well?	It may cause condensation and water dripping.
5	Is the voltage of power supply according to the voltage marked on the nameplate?	It may cause malfunction or damage the parts.
6	Is electric wiring and pipeline installed correctly?	It may cause malfunction or damage the parts.
7	Is the unit grounded securely?	It may cause electric leakage.
8	Does the power cord follow the specification?	It may cause malfunction or damage the parts.
9	Is there any obstruction in air inlet and air outlet?	It may cause insufficient cooling (heating).
10	The dust and sundries caused during installation are removed?	It may cause malfunction or damaging the parts.
11	The gas valve and liquid valve of connection pipe are open completely?	It may cause insufficient cooling (heating) capacity.

2. Test operation

(1) Preparation of test operation

● The client approves the air conditioner installation.

● Specify the important notes for air conditioner to the client.

(2) Method of test operation

● Put through the power, press ON/OFF button on the remote controller to start operation.

● Press MODE button to select AUTO, COOL, DRY, FAN and HEAT to check whether the operation is normal or not.

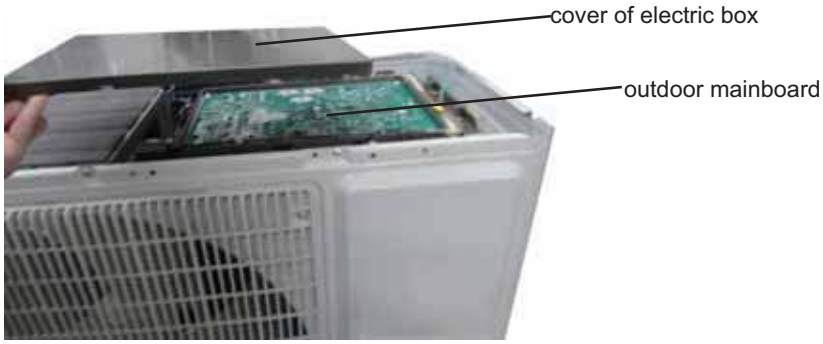
● If the ambient temperature is lower than 16℃ , the air conditioner can’t start cooling.

9. Maintenance

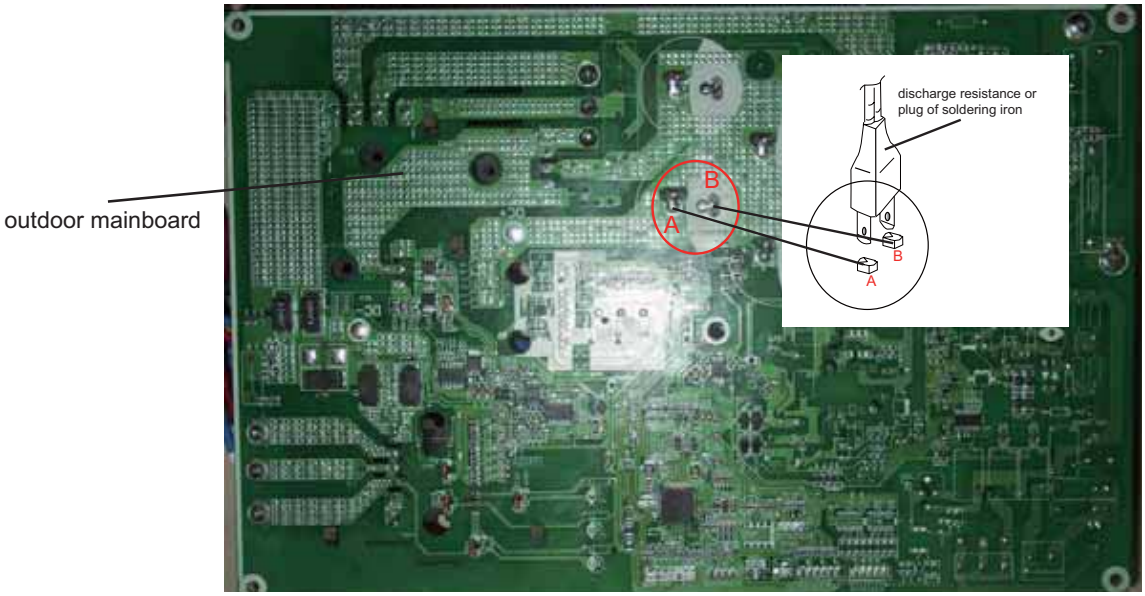
9.1 Precautions before Performing Inspection or Repair

There are high-capacity electrolytic capacitors on the outdoor mainboard. Thus, even the power is cut off, there is high voltage inside the capacitors and it needs more than 20min to reduce the voltage to safety value. Touching the electrolytic capacitor within 20min after cutting the power will cause electric shock. If maintenance is needed, follow the steps below to discharge electricity of electrolytic capacitor after power off.

(1) Open the top cover of outdoor unit and then remove the cover of electric box.



(2) As shown in the fig below, connect the plug of discharge resistance (about 100ohm, 20W) (if there is no discharge resistance, you can use the plug of soldering iron) to point A and B of electrolytic capacitor. There will be sparks when touching them. Press them forcibly for 30s to discharge electricity of electrolytic capacitor.



(3) After finish discharging electricity, measure the voltage between point A and B with universal meter to make sure if electricity discharging is completed, in order to prevent electric shock. If the voltage between the two points is below 20V, you can perform maintenance safely.

9.2 Flashing LED of Indoor/Outdoor Unit and Primary Judgement

Applicable for 09 & 12K model(Nixie tube is not available for A8 panel.)

NO.	Malfunction Name	Display Method of Indoor Unit			Display Method of Outdoor Unit			A/C status	Possible Causes
		Indicator Display (during blinking, ON 0.5s and OFF 0.5s)			Indicator has 3 kinds of display status and during blinking, ON 0.5s and OFF 0.5s				
		Operation Indicator	Cool Indicator	Heating Indicator	Yellow Indicator	Red Indicator	Green Indicator		
1	High pressure protection of system	OFF 3s and blink once						During cooling and drying operation, except indoor fan operates, all loads stop operation. During heating operation, the complete unit stops.	Possible reasons: 1. Refrigerant was superabundant; 2. Poor heat exchange (including filth blockage of heat exchanger and bad radiating environment); Ambient temperature is too high.
2	Antifreezing protection	OFF 3S and blink twice			OFF 3S and blink 3 times			During cooling and drying operation, compressor and outdoor fan stop while indoor fan operates.	1. Poor air-return in indoor unit; 2. Fan speed is abnormal; 3. Evaporator is dirty.
3	System block or refrigerant leakage	OFF 3S and blink 3 times				OFF 3S and blink 9 times		The Dual-8 Code Display will show E3 until the low pressure switch stop operation.	1.Low-pressure protection 2.Low-pressure protection of system 3.Low-pressure protection of compressor
4	High discharge temperature protection of compressor	OFF 3S and blink 4 times			OFF 3S and blink 7 times			During cooling and drying operation, compressor and outdoor fan stop while indoor fan operates. During heating operation, all loads stop.	Please refer to the malfunction analysis (discharge protection, overload).
5	Overcurrent protection	OFF 3S and blink 5 times			OFF 3S and blink 5 times			During cooling and drying operation, compressor and outdoor fan stop while indoor fan operates. During heating operation, all loads stop.	1. Supply voltage is unstable; 2. Supply voltage is too low and load is too high; 3. Evaporator is dirty.
6	Communi-cation Malfunction	OFF 3S and blink 6 times					OFF	During cooling operation, compressor stops while indoor fan motor operates. During heating operation, the complete unit stops.	Refer to the corresponding malfunction analysis.
7	High temperature resistant protection	OFF 3S and blink 8 times			OFF 3S and blink 6 times			During cooling operation: compressor will stop while indoor fan will operate. During heating operation, the complete unit stops.	Refer to the malfunction analysis (overload, high temperature resistant).
8	EEPROM malfunction			OFF 3S and blink 15 times	OFF 3S and blink 11 times			During cooling and drying operation, compressor will stop while indoor fan will operate; During heating operation, the complete unit will stop	Replace outdoor control panel AP1
9	Limit/ decrease frequency due to high temperature of module		OFF 3S and blink 6 times	OFF 3S and blink 6 times				All loads operate normally, while operation frequency for compressor is decreased	Discharging after the complete unit is de-energized for 20mins, check whether the thermal grease on IPM Module of outdoor control panel AP1 is sufficient and whether the radiator is inserted tightly. If its no use, please replace control panel AP1.
10	Malfunction protection of jumper cap	OFF 3S and blink 15 times						Wireless remote receiver and button are effective, but can not dispose the related command	1. No jumper cap insert on mainboard. 2. Incorrect insert of jumper cap. 3. Jumper cap damaged. 4. Abnormal detecting circuit of mainboard.

NO.	Malfunction Name	Display Method of Indoor Unit			Display Method of Outdoor Unit			A/C status	Possible Causes
		Indicator Display (during blinking, ON 0.5s and OFF 0.5s)			Indicator has 3 kinds of display status and during blinking, ON 0.5s and OFF 0.5s				
		Operation Indicator	Cool Indicator	Heating Indicator	Yellow Indicator	Red Indicator	Green Indicator		
11	Gathering refrigerant	OFF 3S and blink 1 times	OFF 3S and blink 1 times					When the outdoor unit receive signal of Gathering refrigerant ,the system will be forced to run under cooling mode for gathering refrigerant	Nominal cooling mode
12	Indoor ambient temperature sensor is open/short circuited		OFF 3S and blink once					During cooling and drying operation, indoor unit operates while other loads will stop; during heating operation, the complete unit will stop operation.	1. Loosening or bad contact of indoor ambient temp. sensor and mainboard terminal. 2. Components in mainboard fell down leads short circuit. 3. Indoor ambient temp. sensor damaged.(check with sensor resistance value chart) 4. Mainboard damaged.
13	Indoor evaporator temperature sensor is open/short circuited		OFF 3S and blink twice					AC stops operation once reaches the setting temperature. Cooling, drying: internal fan motor stops operation while other loads stop operation; heating: AC stop operation	1. Loosening or bad contact of Indoor evaporator temp. sensor and mainboard terminal. 2. Components on the mainboard fall down leads short circuit. 3. Indoor evaporator temp. sensor damaged.(check temp. sensor value chart for testing) 4. Mainboard damaged.
14	Outdoor ambient temperature sensor is open/short circuited		OFF 3S and blink 3 times			OFF 3S and blink 6 times		During cooling and drying operating, compressor stops while indoor fan operates; During heating operation, the complete unit will stop operation	Outdoor temperature sensor hasnt been connected well or is damaged. Please check it by referring to the resistance table for temperature sensor)
15	Outdoor condenser temperature sensor is open/short circuited		OFF 3S and blink 4 times			OFF 3S and blink 5 times		During cooling and drying operation, compressor stops while indoor fan will operate; During heating operation, the complete unit will stop operation.	Outdoor temperature sensor hasnt been connected well or is damaged. Please check it by referring to the resistance table for temperature sensor)
16	Outdoor discharge temperature sensor is open/short circuited		OFF 3S and blink 5 times			OFF 3S and blink 7 times		During cooling and drying operation, compressor will sop after operating for about 3 mins, while indoor fan will operate; During heating operation, the complete unit will stop after operating for about 3 mins.	1.Outdoor temperature sensor hasnt been connected well or is damaged. Please check it by referring to the resistance table for temperature sensor) 2.The head of temperature sensor hasnt been inserted into the copper tube
17	Limit/ decrease frequency due to overload		OFF 3S and blink for 6 times			OFF 3S and blink 3 times		All loads operate normally, while operation frequency for compressor is decreased	Refer to the malfunction analysis (overload, high temperature resistant)
18	Decrease frequency due to overcurrent		OFF 3S and blink 8 times			OFF 3S and blink once		All loads operate normally, while operation frequency for compressor is decreased	The input supply voltage is too low; System pressure is too high and overload

NO.	Malfunction Name	Display Method of Indoor Unit			Display Method of Outdoor Unit			A/C status	Possible Causes
		Indicator Display (during blinking, ON 0.5s and OFF 0.5s)			Indicator has 3 kinds of display status and during blinking, ON 0.5s and OFF 0.5s				
		Operation Indicator	Cool Indicator	Heating Indicator	Yellow Indicator	Red Indicator	Green Indicator		
19	Decrease frequency due to high air discharge		OFF 3S and blink 9 times			OFF 3S and blink twice		All loads operate normally, while operation frequency for compressor is decreased	Overload or temperature is too high; Refrigerant is insufficient; Malfunction of electric expansion valve (EKV)
20	Limit/ decrease frequency due to antifreezing		OFF 3S and blink 2 times	OFF 3S and blink 2 times		OFF 3S and blink 4 times		All loads operate normally, while operation frequency for compressor is decreased	Poor air-return in indoor unit or fan speed is too low
21	Voltage for DC bus-bar is too high		OFF 3S and blink 11 times		OFF 3S and blink 13 times			During cooling and drying operation, compressor will stop while indoor fan will operate; During heating operation, the complete unit will stop operation.	1. Measure the voltage of position L and N on wiring board (XT), if the voltage is higher than 265VAC, turn on the unit after the supply voltage is increased to the normal range. 2.If the AC input is normal, measure the voltage of electrolytic capacitor C on control panel (AP1), if its normal, theres malfunction for the circuit, please replace the control panel (AP1)
22	Voltage of DC bus-bar is too low			OFF 3S and blink 21 times	OFF 3S and blink 12 times			During cooling and drying operation, compressor will stop while indoor fan will operate; During heating operation, the complete unit will stop	1. Measure the voltage of position L and N on wiring board (XT), if the voltage is higher than 150VAC, turn on the unit after the supply voltage is increased to the normal range. 2.If the AC input is normal, measure the voltage of electrolytic capacitor C on control panel (AP1), if its normal, theres malfunction for the circuit, please replace the control panel (AP1)
23	Compressor Min frequence in test state								Showing during min. cooling or min. heating test
24	Compressor rated frequence in test state								Showing during nominal cooling or nominal heating test
25	Compressor maximum frequence in test state								Showing during max. cooling or max. heating test

NO.	Malfunction Name	Display Method of Indoor Unit			Display Method of Outdoor Unit			A/C status	Possible Causes
		Indicator Display (during blinking, ON 0.5s and OFF 0.5s)			Indicator has 3 kinds of display status and during blinking, ON 0.5s and OFF 0.5s				
		Operation Indicator	Cool Indicator	Heating Indicator	Yellow Indicator	Red Indicator	Green Indicator		
26	Compressor intermediate frequence in test state								Showing during middle cooling or middle heating test
27	Overcurrent protection of phase current for compressor		OFF 3S and blink 15 times					During cooling and drying operation, compressor will stop while indoor fan will operate; During heating operation, the complete unit will stop operation.	Refer to the malfunction analysis (IPM protection, loss of synchronism protection and overcurrent protection of phase current for compressor.
28	Charging malfunction of capacitor			OFF 3S and blink 17 times				During cooling and drying operation, compressor will stop while indoor fan will operate; During heating operation, the complete unit will stop	Refer to the part three—charging malfunction analysis of capacitor
29	Malfunction of module temperature sensor circuit			OFF 3S and blink 18 times				During cooling and drying operation, compressor will stop while indoor fan will operate; During heating operation, the complete unit will stop	Replace outdoor control panel AP1
30	Module high temperature protection			OFF 3S and blink 19 times				During cooling operation, compressor will stop while indoor fan will operate; During heating operation, the complete unit will stop	After the complete unit is de-energized for 20mins, check whether the thermal grease on IPM Module of outdoor control panel AP1 is sufficient and whether the radiator is inserted tightly. If its no use, please replace control panel AP1.
31	Overload protection for compressor			OFF 3S and blink 3 times	OFF 3S and blink 8 times			During cooling and drying operation, compressor will stop while indoor fan will operate; During heating operation, the complete unit will stop operation.	1. Wiring terminal OVC-COMP is loosened. In normal state, the resistance for this terminal should be less than 1ohm. 2.Refer to the malfunction analysis (discharge protection, overload)
32	IPM protection			OFF 3S and blink 5 times	OFF 3S and blink 4 times			During cooling and drying operation, compressor will stop while indoor fan will operate; During heating operation, the complete unit will stop operation.	Refer to the malfunction analysis (IPM protection, loss of synchronism protection and overcurrent protection of phase current for compressor.
33	Module temperature is too high			OFF 3S and blink 5 times	OFF 3S and blink 10 times				

NO.	Malfunction Name	Display Method of Indoor Unit			Display Method of Outdoor Unit			A/C status	Possible Causes
		Indicator Display (during blinking, ON 0.5s and OFF 0.5s)			Indicator has 3 kinds of display status and during blinking, ON 0.5s and OFF 0.5s				
		Operation Indicator	Cool Indicator	Heating Indicator	Yellow Indicator	Red Indicator	Green Indicator		
34	Internal motor (fan motor) do not operate	OFF 3S and blink 11 times						Internal fan motor, external fan motor, compressor and electric heater stop operation,guide louver stops at present location.	1. Bad contact of DC motor feedback terminal. 2. Bad contact of DC motor control end. 3. Fan motor is stalling. 4. Motor malfunction. 5. Malfunction of mainboard rev detecting circuit.
35	Desynchro-nizing of compressor			OFF 3S and blink 7 times				During cooling and drying operation, compressor will stop while indoor fan will operate; During heating operation, the complete unit will stop operation.	Refer to the malfunction analysis (IPM protection, loss of synchronism protection and overcurrent protection of phase current for compressor.
36	PFC protection			OFF 3S and blink 6 times	OFF 3S and blink 14 times			During cooling and drying operation, compressor will stop while indoor fan will operate; During heating operation, the complete unit will stop operation.	Refer to the malfunction analysis
37	Outdoor DC fan motor malfunction	OFF 3S and blink 23 times				OFF 3S and blink 14 times		Outdoor DC fan motor malfunction lead to compressor stop operation,	DC fan motor malfunction or system blocked or the connector loosed
38	power protection	OFF 3S and blink 20 times			OFF 3S and blink 9 times			compressor stop operation and Outdoor fan motor will stop 30s latter , 3 minutes latter fan motor and compressor will restart	To protect the electronical components when detect high power
39	Indoor unit and outdoor unit doesnt match	OFF 3S and blink 19 times			OFF 3S and blink 16 times			compressor and Outdoor fan motor cant work	Indoor unit and outdoor unit doesnt match
40	Failure start-up			OFF 3S and blink 11 times				During cooling and drying operation, compressor will stop while indoor fan will operate; During heating operation, the complete unit will stop operation.	Refer to the malfunction analysis
4	Normal communica-tion						contino-usly		
42	Defrosting			OFF 3S and blink once (during blinking, ON 10s and OFF 0.5s)	OFF 3S and blink twice			Defrosting will occur in heating mode. Compressor will operate while indoor fan will stop operation.	Its the normal state

NO.	Malfunction Name	Display Method of Indoor Unit			Display Method of Outdoor Unit			A/C status	Possible Causes
		Indicator Display (during blinking, ON 0.5s and OFF 0.5s)			Indicator has 3 kinds of display status and during blinking, ON 0.5s and OFF 0.5s				
		Operation Indicator	Cool Indicator	Heating Indicator	Yellow Indicator	Red Indicator	Green Indicator		
43	Malfunction of phase current detection circuit for compressor			OFF 3S and blink 13 times				During cooling and drying operation, compressor will stop while indoor fan will operate; During heating operation, the complete unit will stop	Replace outdoor control panel AP1
44	Malfunction of voltage dropping for DC bus-bar			OFF 3S and blink 20 times				During cooling and drying operation, compressor will stop while indoor fan will operate; During heating operation, the complete unit will stop	Supply voltage is unstable
45	Malfunction of complete units current detection		OFF 3S and blink 13 times					During cooling and drying operation, the compressor will stop while indoor fan will operate; During heating operating, the complete unit will stop operation.	Theres circuit malfunction on outdoor units control panel AP1, please replace the outdoor units control panel AP1.
46	The four-way valve is abnormal		OFF 3S and blink 20 times					If this malfunction occurs during heating operation, the complete unit will stop operation.	1.Supply voltage is lower than AC175V; 2.Wiring terminal 4V is loosened or broken; 3.4V is damaged, please replace 4V.
47	Frequency limiting (power)					OFF 3S and blink 13 times			
48	Compressor is open-circuited				OFF 3S and blink once				
49	The temperature for turning on the unit is reached					OFF 3S and blink 8 times			
50	Frequency limiting (module temperature)					OFF 3S and blink 11 times			
51	Malfunction of zero-cross detection circuit	OFF 3S and blink 17 times						The complete unit stops	1.Power supply is abnormal; 2.Detection circuit of indoor control mainboard is abnormal.

Applicable for 18 & 24K model(Nixie tube is not available for A8 panel.)

NO.	Name of malfunction	Indoor unit displaying method Indicator display(LED blinks 0.5s-ON/0.5s-OFF)			Outdoor unit display(LEDs have 3 status)□OFF ■ON ☆ Blinks				AC status	Malfunctions
		Running LED	Cooling LED	Heating LED	D40/D5	D41/D6	D42/ D16	D43/ D30		
1	System high pressure protection	3s off blink once			□	☆	☆	☆	cooling,dehumidifying,except the indoor fam motor is runnig,others will stop to run. heating;all stop running	High pressure of system,might be: 1.Refrigerant is too much; 2.Poor heating exchanging for units(including heat exchanger is dirty and unit heating radiating ambient is poor); 3.Ambient temp.is too high.
2	Anti-freezing protection	3s off blink twice			■	□	■	□	cooling,dehumidifying,compressor,outdoor fan motor will stop running,indoor fan motor will keep running.	1.Poor indoor unit air returning; 2.Indoor fan motor rotating speed abnormal; 3.Evaporator is dirty;
3	Compressor air exhaust high temp. protection	3s off blink four times			■	□	■	☆	cooling,dehumidifying,compressor,outdoor fan motor will stop running,indoor fan motor works. heating:all stop running.	Pls refer to rtouble shoot (air exhaust protection,overload)
4	AC overload protection	Off 3s blink 5 times			□	■	☆	□	Cooling,dehumidifying,compressor,outdoor fan motor will stop,indoor fan will work. heating;all will stop	1.power supply is stable,fluctuation is too much 2.Power supply is too low,overload is too much.
5	Indoor and outdoor units communication malfunction	Off 3s blink 6 times			□	□	□	☆	Cooling,compressor will stop,indoor fan motor works,Heating:all will stop	Please refer to troubleshooting
6	Anti-high temp. protection	Off 3s blink 8 times			■	□	■	■	Cooling,compressor will stop,indoor fan motor works,Heating:all will stop	Please refer to troubleshooting
7	Indoor unit motor no feedback	Off 3s blink 11 times							Whole unit will stop to run	1.Poor insert for GPF 2.Indoor control board AP1 malfunction 3.Indoor motor M1 malfunction
8	Jump wire cap malfunction protection	Off 3s blink 15 times							Whole unit will stop to run	Indoor control board AP1 jump cap poor connected,please reinsert or replace the jump cap.
9	Indoor ambient sensor open circuit,short circuit		Off 3s blink once						Cooling,dehumidifying:indoor fan motor is runing,other overloads will stop;Heating,whole unit will stop to run.	1.Room temp.sensor is not connected with the control panel AP1 2.Room temp.sensor is damaged
10	Indoor evaporator sensor ciruit open,short circuit		Off 3s blink twice						Cooling,dehumidifying;indoor fan motor runing,other overload will stop;Heating,whole unit will stop.	1,Tube temp.sensor is not connected with the conrtol panel AP1 2.Tube tmep.sensor is damaged
11	Outdoor ambient sensor circuit open,circuit short		Off 3s blinks three times		□	□	☆	■	Cooling,dehumidifying;compressor will stop,indoor fan motor will work.Heat:all will stop	Outdoorroom temp.sensor hasnt connected well,or damaged,please refer to the sensor resistance value for checking.
12	Outdoor condemsor sensor open circuit,short circuit		Off 3s blinks 4 times		□	□	☆	□	Cooling,dehumidifying;compressor will stop,indoor fan motor will work.Heat:all will stop	Outdoorroom temp.sensor hasnt connected well,or damaged,please refer to the sensor resistance value for checking.
13	Outdoor air exhaust sensor open circuit,short circuit		Off 3s blinks 5 times		□	□	☆	☆	Cooling,dehumidifying;after runing for 3mins later,the compressor will stop to run,indoor fan motor will start to run.heating:after run 3 mins later,all will stop to run.	1.Exhaust temp sensor hasnt connected well,or damaged,plwease refer to the sensor resistance value for checking. 2.Sensor head hasnt insert into the copper tube.
14	Overload limit/ descending frequency		Off 3s blinks 6 times		■	□	☆	☆	Overload mormal operation,compressor is runing,frequency descending	Please refer to troubleshooting

15	Over current need frequency descending		Off 3s blinks 8 times		■	■	□	■	Overload mormal operation,compressor is runing,frequency descending	1.Input power supply is too low 2.System voltage is too high,over is too much
16	Air exhaust over high need frequency descending		Off 3s blinks 9 times		■	■	□	□	Overload mormal operation,compressor is runing,frequency descending	1.Overload is too much,ambient temp.is too high 2.Refrigerant is short 3.Electric expansion malfunction
17	DC generatrix voltage is too high		Off 3s blink 11 times		□	■	□	☆	Cooling,dehumidifying,co mpressor stop running,Fan motor works. Heating: all will stop	1.Testing wire terminal L and N position.If higher than 265VAC,please cut off the power supply and restart until back to normal 2.If input voltage is normal, testing the voltage of electrolytic capacitor on AP1 after turn on the unit.There may be some problem and replace the AP1 if the electrolytic capacitor voltage range at 200-280V
18	Whole units current testing malfunction		Off 3s blink 13 times		□	■	☆	■	Cooling, dehumidifying;compressor stops running,indoor fan motor works. Heating: all will stop running	The circuit on AP1 has malfunction, replace the outdoor unit AP1
19	Compressor current overcurrent protection		Off 3s blink 15 times		□	☆	□	□	Cooling, dehumidifying;compressor stops running,indoor fan motor works. Heating: all will stop running	Please refer to troubleshooting(IPM protection, compressor lose steps, compressor current overcurrent protection)
20	Defrosting			Off 0.5s blink 10s					Under the heating mode,compressor running, indoor/outdoorfan motor stop working	It is normal function
21	Compressor overload protection			Off 3s blink 3 times	□	☆	☆	□	Cooling, dehumidifying;compressor stops running,indoor fan motor works. Heating: all will stop running	1. Wire terminal OVCCOMP loosen or circuit,has problem, the resistance of SAT should be lower than 1 ohm. 2.Please refer to troubleshooting(exhaust/overload protection)
22	IPM protection			Off 3s blink 5 times	■	□	■	■	Cooling, dehumidifying;compressor stops running,indoor fan motor works. Heating: all will stop running	Pls refer to troubleshooting
23	Outdoor DC fan motor malfunction	OFF 3S and blink 23 times			■	□	□	□	Outdoor DC fan motor malfunction lead to compressor stop operation,	DC fan motor malfunction or system blocked or the connector loosed
24	Malfunction of zero-cross detection circuit	Off 3s blink 17 times							The complete unit stops	1.Power supply is abnormal; 2.Detection circuit of indoor control mainboard is abnormal.
25	PFC protection			Off 3s blink 6 times	□	■	☆	☆	Cooling, dehumidifying;compressor stops running,indoor fan motor works. Heating: all will stop running	Pls refer to troubleshooting
26	Compressor lose steps			Off 3s blink 7 times	□	☆	■	☆	Cooling, dehumidifying;compressor stops running,indoor fan motor works. Heating: all will stop running	Pls refer to troubleshooting
27	Startsup fail			Off 3s blink 11 times	□	☆	□	☆	Cooling, dehumidifying;compressor stops running,indoor fan motor works. Heating: all will stop running	Pls refer to troubleshooting
28	Compressor current testing circuit malfunction			Off 3s blink 13 times	□	☆	■	□		Replace the outdoor control board AP1
29	EEPROM malfunction			Off 3s blink 15 times	□	□	□	■	Cooling, dehumidifying;compressor stops running,indoor fan motor works. Heating: all will stop running	Replace the outdoor control board AP1

30	Capacitor charge malfunction			Off 3s blink 17 times	□	■	□	■	Cooling, dehumidifying;compressor stops running,indoor fan motor works. Heating: all will stop running	Pls refer to Part 3 capacitor charging fault of troubleshooting
31	Module sensor circuit diagram			Off 3s blink 18 times	□	□	■	☆	Cooling, dehumidifying;compressor stops running,indoor fan motor works. Heating: all will stop running	Replace the outdoor control board AP1
32	Module temp. over high protection			Off 3s blink 19 times	■	□	☆	■	Cooling, dehumidifying;compressor stops running,indoor fan motor works. Heating: all will stop running	To check whether the ambient Temp. of IPM is too high or the heat-sinhing of IPM is dirty else replace the outdoor baord AP1
33	DC Bus voltage dips			Off 3s blink 20 times	□	■	■	■	Cooling, dehumidifying;compressor stops running,indoor fan motor works. Heating: all will stop running	Power voltage is not stable
34	Low DC Bus voltage protection			Off 3s blink 21 times	□	■	■	□	Cooling, dehumidifying;compressor stops running,indoor fan motor works. Heating: all will stop running	1.Check the Input voltage if the Voltage is lower than 150VAC,restart the machine when the power supply is mormal. 2.Checking the reactor L connection.
35	IPM temp.is too high limit/ decrease frequency				■	■	■	☆	Over load normal works,compressor runing frequency declines	Whole unit break for 20 mins and discharge,to check the outdoor control board AP1s IPM module coolant whether is short,the radiator is tightened.If above phenomenon is not OK,Please improve or replace the control board AP1
36	Four-way valve abnormal				■	□	☆	□	This malfunction happened,only in heating mode,all will stop to run.	1.Power supply voltage is lower than AC175V 2.Wire terminal 4V loosen or wire break 3.4V damaged,replace 4V
37	Outdoor unit zero-cross detecting error				■	■	☆	□	Cooling:compressor will stop,indoor fan motor works. Heating:all will stop.	Replace the outdoor control board AP1
38	Anti-freezing llmit/decrease frequency				■	■	■	□	All loads work normally but the running frequency limited or decrease	Indoor unit air return is poor or fan speed is to low.

9.3 Procedure of Troubleshooting

Applicable for 09 & 12K model

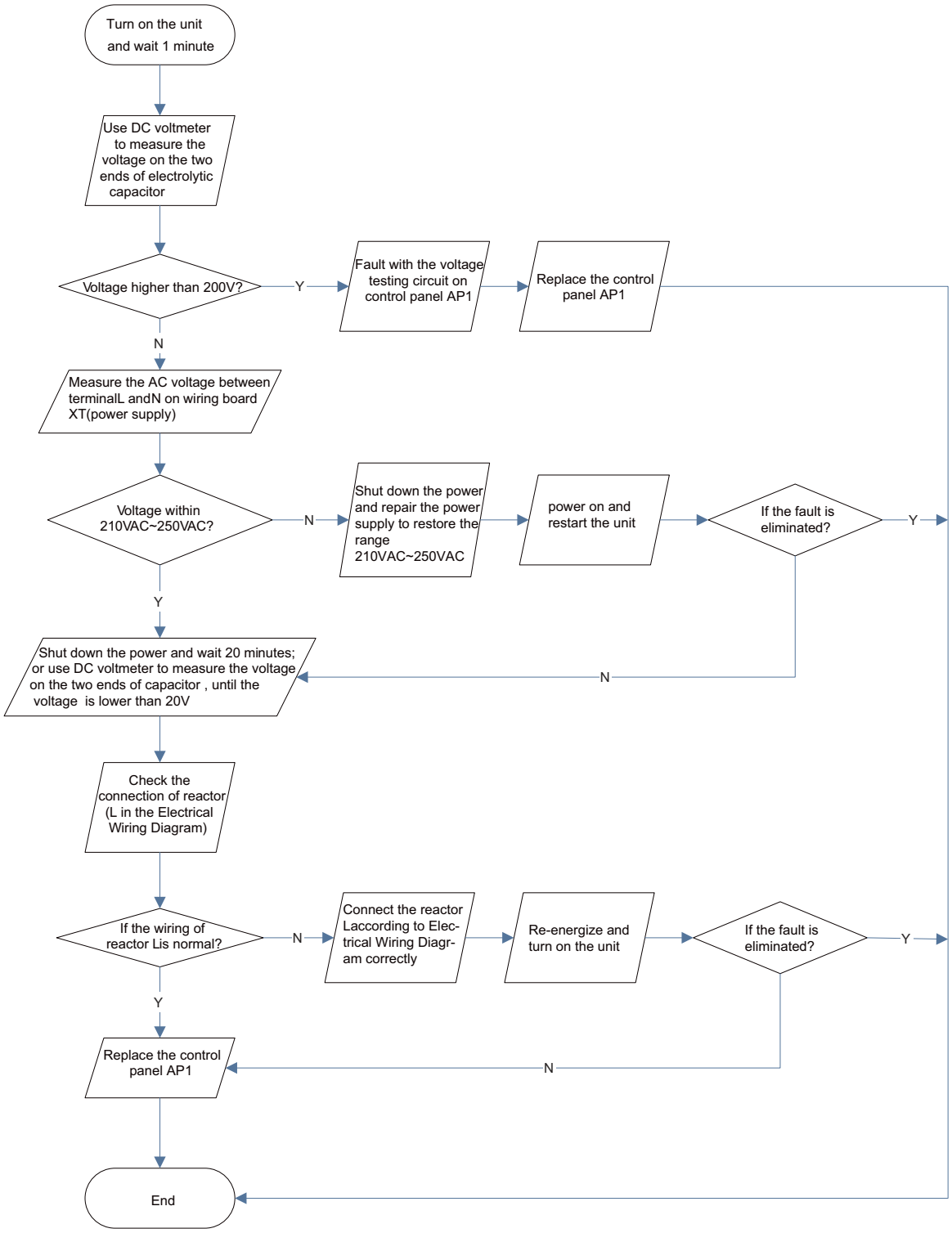
(1) Capacitor charge fault (Fault with outdoor unit) (AP1 below refers to the outdoor control panel)

Main Check Points:

●Use AC voltmeter to check if the voltage between terminal L and N on the wiring board is within 210VAC~240VAC.

●Is the reactor (L) correctly connected? Is the connection loose or fallen? Is the reactor (L) damaged?

Fault diagnosis process:


Turn on the unit and wait 1 minute
Use DC voltmeter to measure the voltage on the two ends of electrolytic capacitor
Voltage higher than 200V?
Y
Fault with the voltage testing circuit on control panel AP1
Replace the control panel AP1
N
Measure the AC voltage between terminalL andN on wiring board XT(power supply)
Voltage within 210VAC~250VAC?
N
Shut down the power and repair the power supply to restore the range 210VAC~250VAC
power on and restart the unit
If the fault is eliminated?
Y
Y
Shut down the power and wait 20 minutes; or use DC voltmeter to measure the voltage on the two ends of capacitor , until the voltage is lower than 20V
N
Check the connection of reactor (L in the Electrical Wiring Diagram)
If the wiring of reactor Lis normal?
N
Connect the reactor Laccording to Electrical Wiring Diagram correctly
Re-energize and turn on the unit
If the fault is eliminated?
Y
Y
Replace the control panel AP1
N
End

(2) IPM Protection, Out-of-step Fault, Compressor Phase Overcurrent (AP1 below refers to the outdoor control panel)

Main check points:

●Is the connection between control panel AP1 and compressor COMP secure? Loose? Is the connection in correct order?

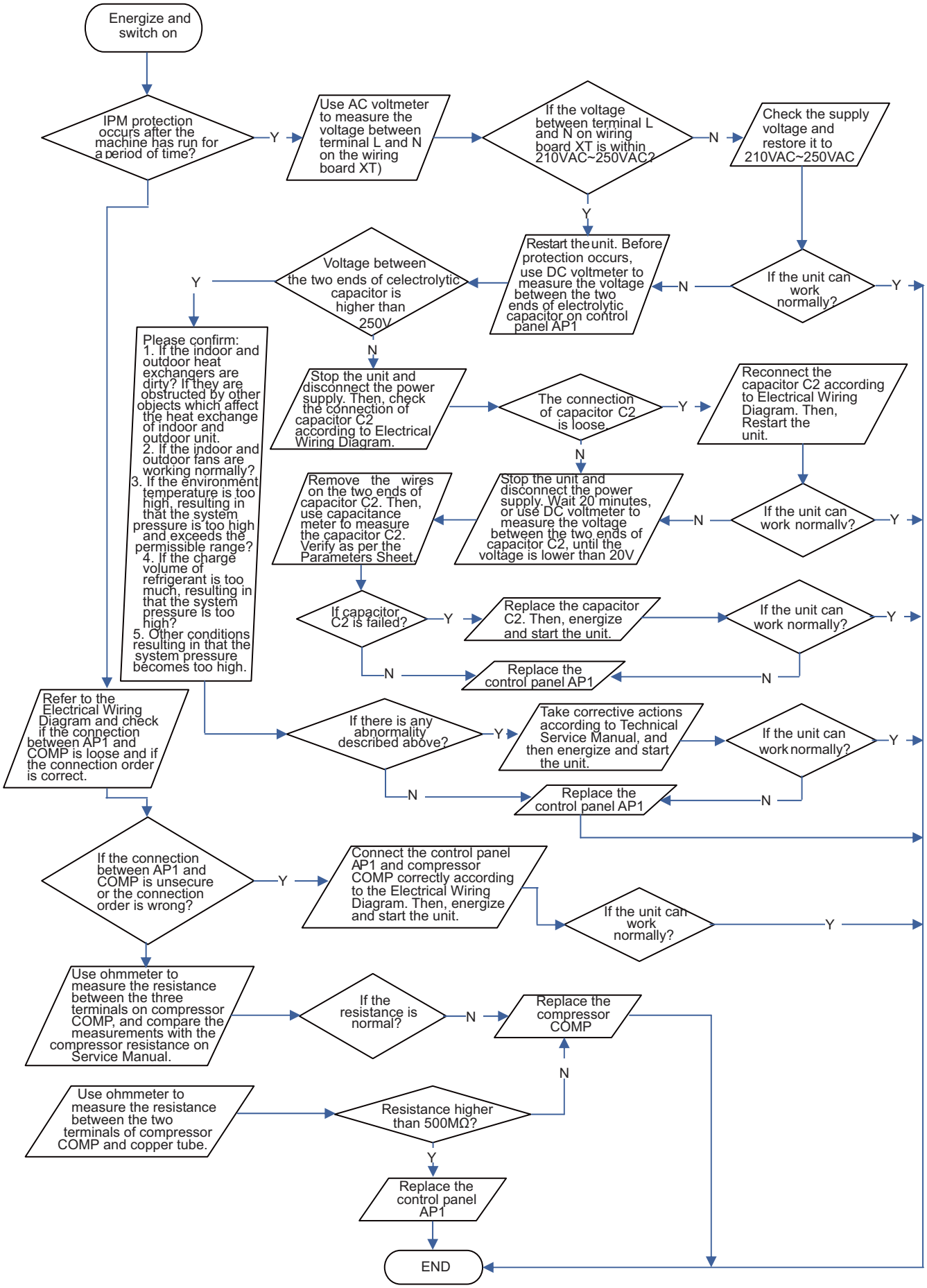
●Is the voltage input of the machine within normal range? (Use AC voltmeter to measure the voltage between terminal L and N on the wiring board XT)

●Is the compressor coil resistance normal? Is the insulation of compressor coil against the copper tube in good condition?

●Is the working load of the machine too high? Is the radiation good?

●Is the charge volume of refrigerant correct?

Fault diagnosis process:


Energize and switch on
IPM protection occurs after the machine has run for a period of time?
Y
Use AC voltmeter to measure the voltage between terminal L and N on the wiring board XT)
If the voltage between terminal L and N on wiring board XT is within 210VAC~250VAC?
N
Check the supply voltage and restore it to 210VAC~250VAC
Y
Restart the unit. Before protection occurs, use DC voltmeter to measure the voltage between the two ends of electrolytic capacitor on control panel AP1
N
If the unit can work normally?
Y
Voltage between the two ends of celectrolytic capacitor is higher than 250V
Y
N
Please confirm:
1. If the indoor and outdoor heat exchangers are dirty? If they are obstructed by other objects which affect the heat exchange of indoor and outdoor unit.
2. If the indoor and outdoor fans are working normally?
3. If the environment temperature is too high, resulting in that the system pressure is too high and exceeds the permissible range?
4. If the charge volume of refrigerant is too much, resulting in that the system pressure is too high?
5. Other conditions resulting in that the system pressure becomes too high.
Stop the unit and disconnect the power supply. Then, check the connection of capacitor C2 according to Electrical Wiring Diagram.
The connection of capacitor C2 is loose
Y
Reconnect the capacitor C2 according to Electrical Wiring Diagram. Then, Restart the unit.
N
Stop the unit and disconnect the power supply. Wait 20 minutes, or use DC voltmeter to measure the voltage between the two ends of capacitor C2, until the voltage is lower than 20V
N
If the unit can work normallv?
Y
Remove the wires on the two ends of capacitor C2. Then, use capacitance meter to measure the capacitor C2. Verify as per the Parameters Sheet.
If capacitor C2 is failed?
Y
Replace the capacitor C2. Then, energize and start the unit.
If the unit can work normally?
Y
N
Replace the control panel AP1
N
Refer to the Electrical Wiring Diagram and check if the connection between AP1 and COMP is loose and if the connection order is correct.
If there is any abnormality described above?
Y
Take corrective actions according to Technical Service Manual, and then energize and start the unit.
If the unit can work normally?
Y
N
Replace the control panel AP1
N
If the connection between AP1 and COMP is unsecure or the connection order is wrong?
Y
Connect the control panel AP1 and compressor COMP correctly according to the Electrical Wiring Diagram. Then, energize and start the unit.
If the unit can work normally?
Y
Use ohmmeter to measure the resistance between the three terminals on compressor COMP, and compare the measurements with the compressor resistance on Service Manual.
If the resistance is normal?
N
Replace the compressor COMP
N
Use ohmmeter to measure the resistance between the two terminals of compressor COMP and copper tube.
Resistance higher than 500MΩ?
Y
Replace the control panel AP1
END

(3)High temperature and overload protection diagnosis (AP1 hereinafter refers to the control board of the outdoor unit)

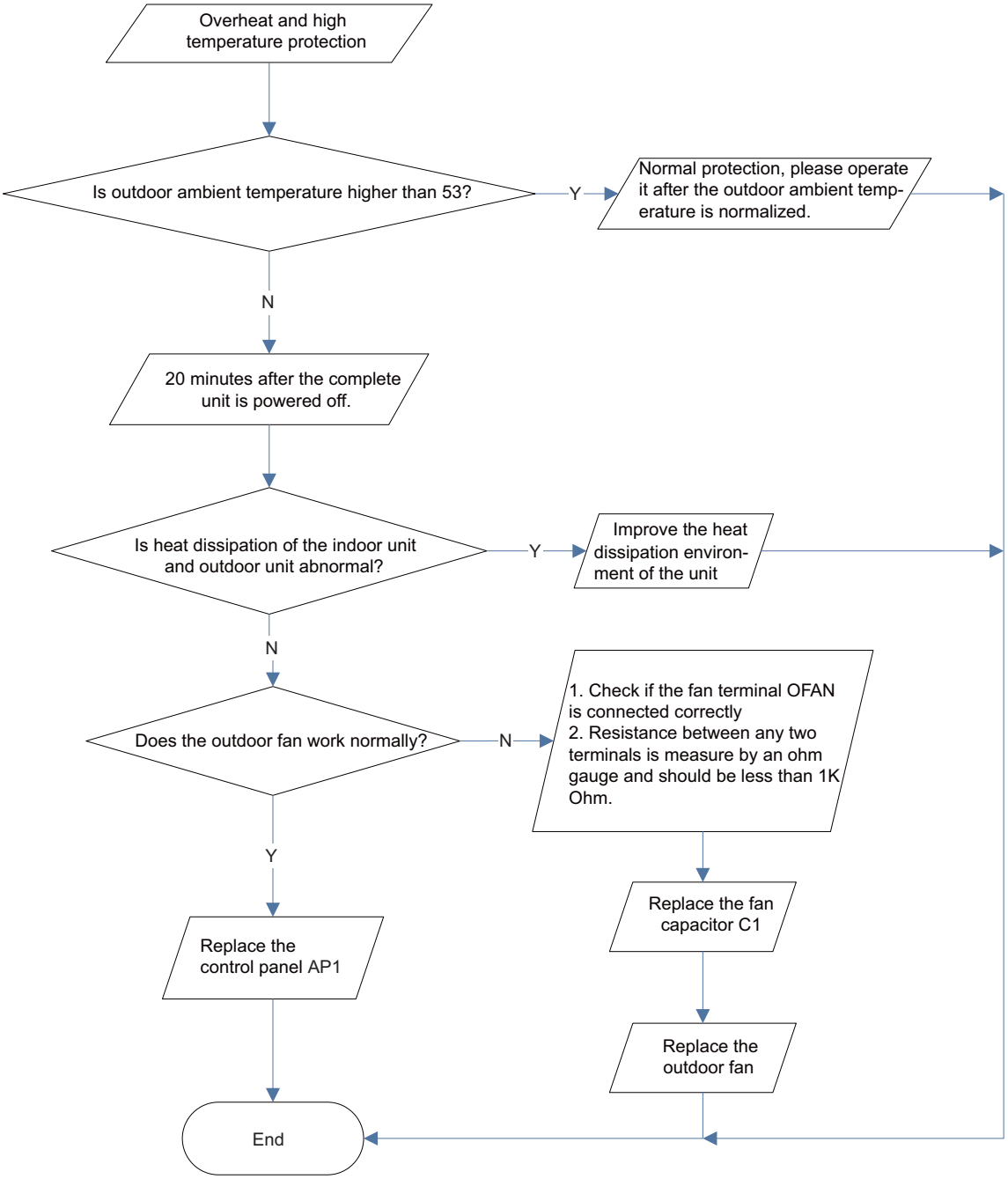
Mainly detect:

●Is outdoor ambient temperature in normal range?

●Are the outdoor and indoor fans operating normally?

●Is the heat dissipation environment inside and outside the unit good?

Fault diagnosis process:


Overheat and high temperature protection
Is outdoor ambient temperature higher than 53?
Y
Normal protection, please operate it after the outdoor ambient temperature is normalized.
N
20 minutes after the complete unit is powered off.
Is heat dissipation of the indoor unit and outdoor unit abnormal?
Y
Improve the heat dissipation environment of the unit
N
Does the outdoor fan work normally?
N
1. Check if the fan terminal OFAN is connected correctly
2. Resistance between any two terminals is measure by an ohm gauge and should be less than 1K Ohm.
Y
Replace the fan capacitor C1
Replace the control panel AP1
Replace the outdoor fan
End

(4) Start-up failure (following AP1 for outdoor unit control board)

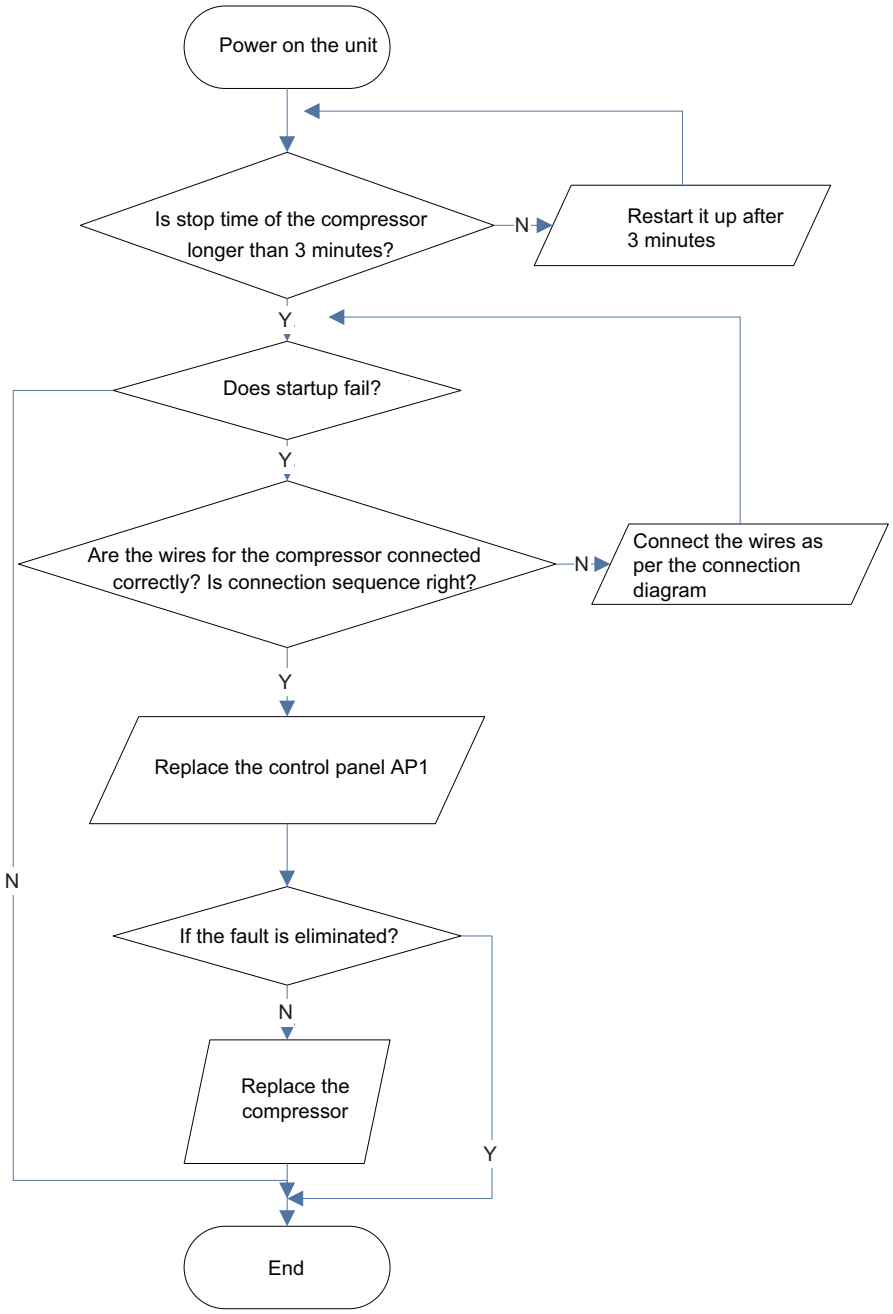
Mainly detect:

●Whether the compressor wiring is connected correct?

●Is compressor broken?

●Is time for compressor stopping enough?

Fault diagnosis process:



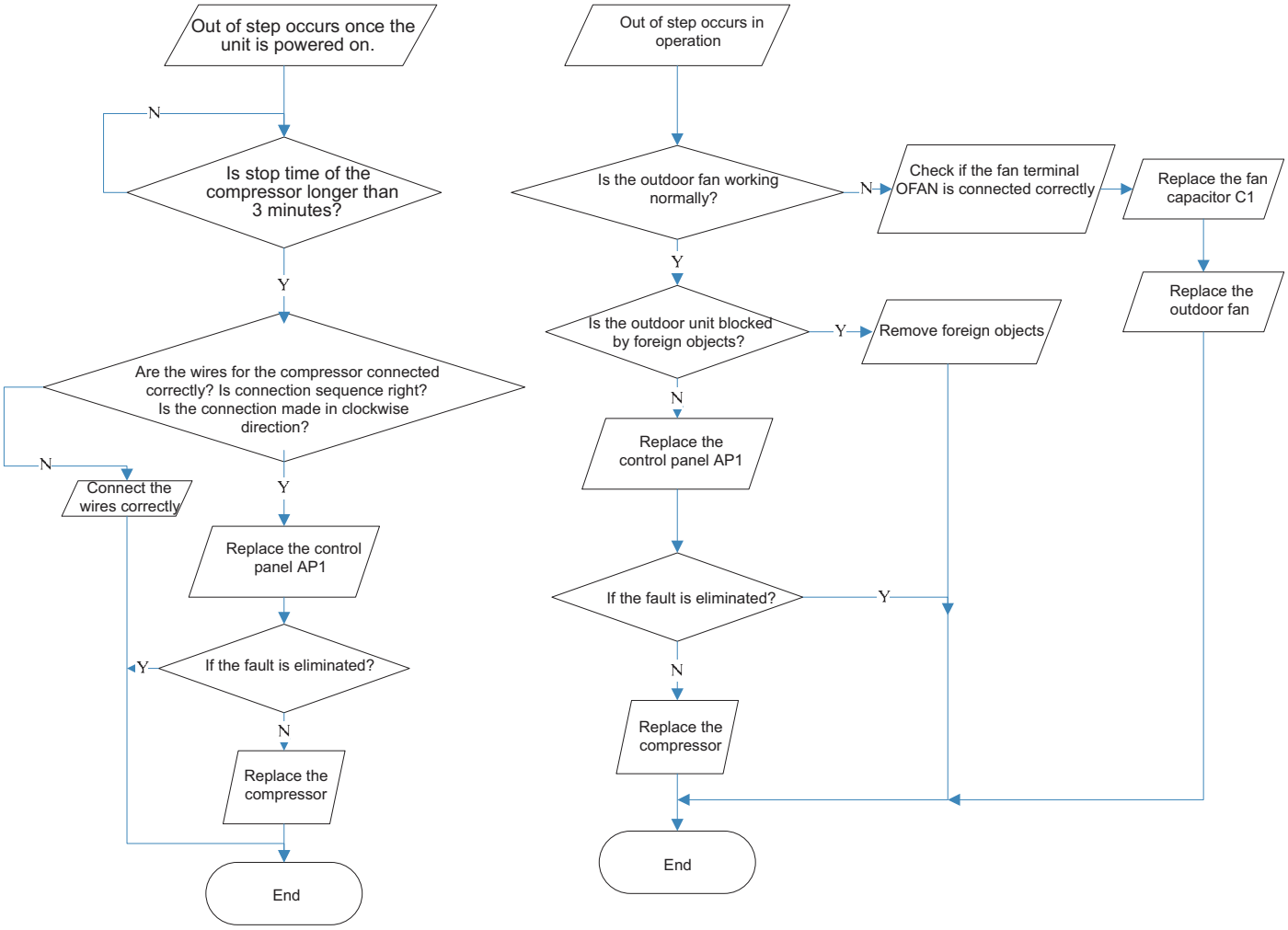
(5) Out of step diagnosis for the compressor (AP1 hereinafter refers to the control board of the outdoor unit)

Mainly detect:

●Is the system pressure too high?

●Is the input voltage too low?

Fault diagnosis process:


Out of step occurs once the unit is powered on.
N
Is stop time of the compressor longer than 3 minutes?
Y
Are the wires for the compressor connected correctly? Is connection sequence right? Is the connection made in clockwise direction?
N
Connect the wires correctly
Y
Replace the control panel AP1
If the fault is eliminated?
Y
N
Replace the compressor
End
Out of step occurs in operation
Is the outdoor fan working normally?
N
Check if the fan terminal OFAN is connected correctly
Replace the fan capacitor C1
Replace the outdoor fan
Y
Is the outdoor unit blocked by foreign objects?
Y
Remove foreign objects
N
Replace the control panel AP1
If the fault is eliminated?
Y
N
Replace the compressor
End

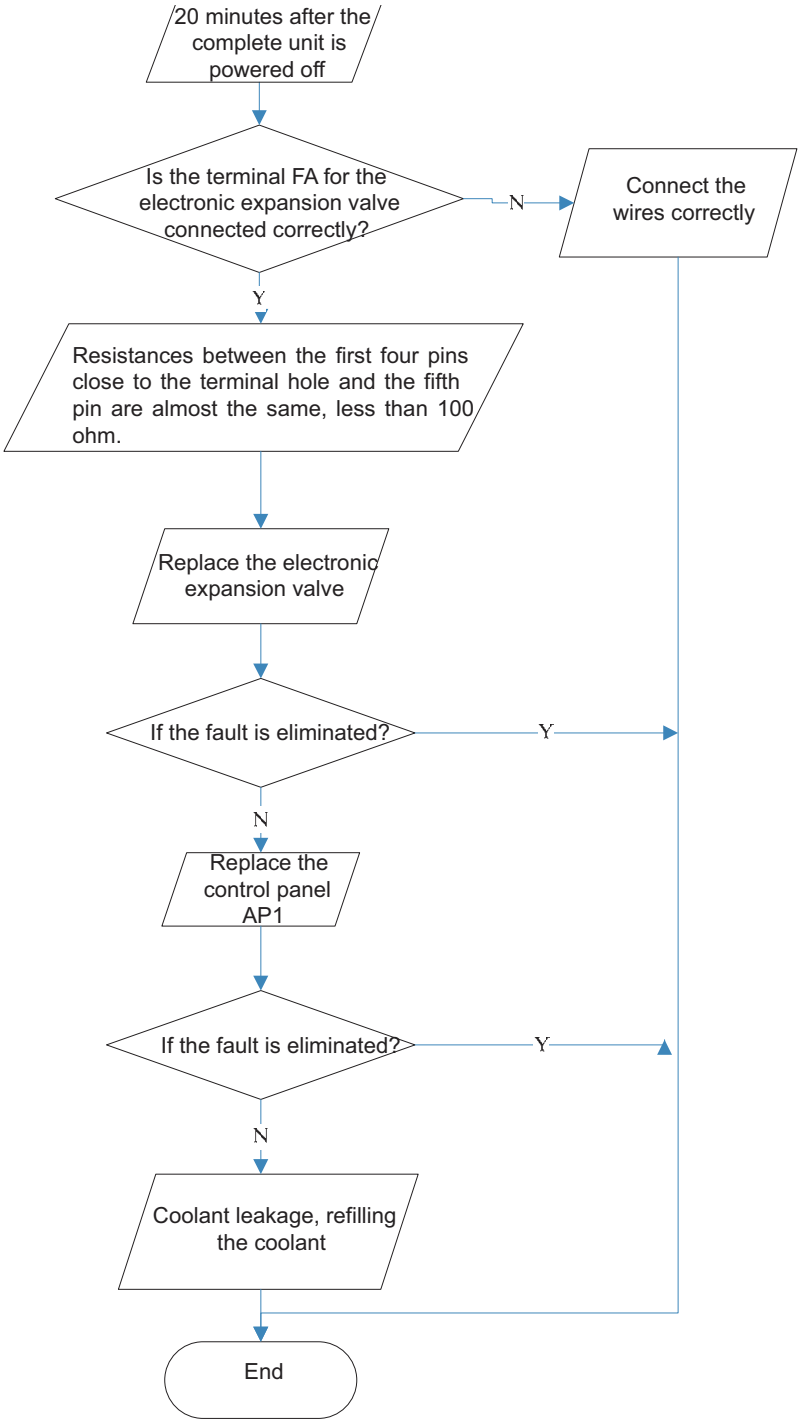
(6)Overload and air exhaust malfunction diagnosis (following AP1 for outdoor unit control board)

Mainly detect:

●Is the PMV connected well or not? Is PMV damaged?

●Is refrigerant leaked?

Fault diagnosis process:

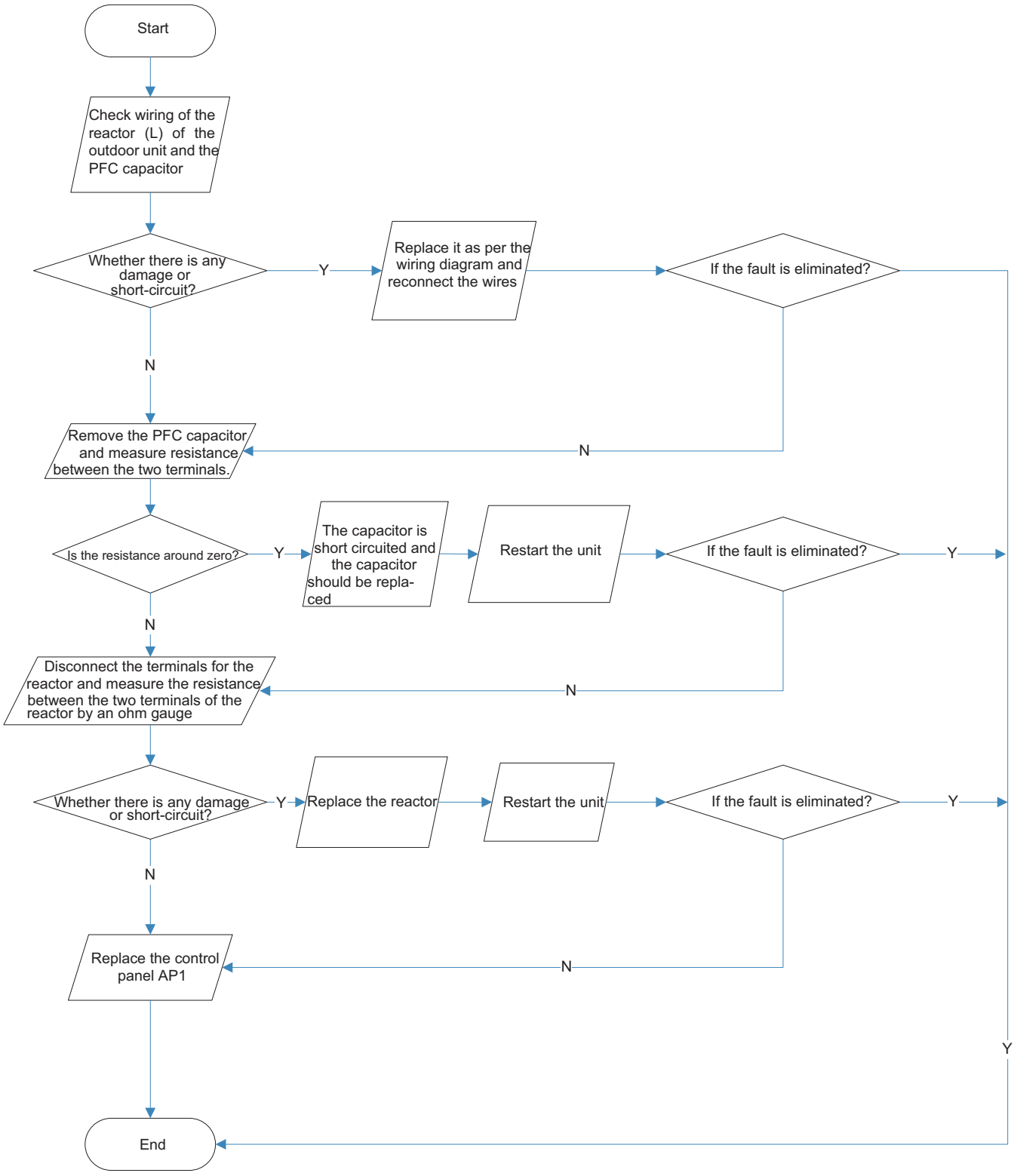

20 minutes after the complete unit is powered off
Is the terminal FA for the electronic expansion valve connected correctly?
N
Connect the wires correctly
Y
Resistances between the first four pins close to the terminal hole and the fifth pin are almost the same, less than 100 ohm.
Replace the electronic expansion valve
If the fault is eliminated?
Y
N
Replace the control panel AP1
If the fault is eliminated?
Y
N
Coolant leakage, refilling the coolant
End

(7)Power factor correct or (PFC) fault (a fault of outdoor unit) (AP1 hereinafter refers to the control board of the outdoor unit)

Mainly detect:

●Check if the reactor (L) of the outdoor unit and the PFC capacitor are broken

Fault diagnosis process:


Start
Check wiring of the reactor (L) of the outdoor unit and the PFC capacitor
Whether there is any damage or short-circuit?
Y
Replace it as per the wiring diagram and reconnect the wires
If the fault is eliminated?
N
Remove the PFC capacitor and measure resistance between the two terminals.
N
Is the resistance around zero?
Y
The capacitor is short circuited and the capacitor should be replaced
Restart the unit
If the fault is eliminated?
Y
N
Disconnect the terminals for the reactor and measure the resistance between the two terminals of the reactor by an ohm gauge
N
Whether there is any damage or short-circuit?
Y
Replace the reactor
Restart the unit
If the fault is eliminated?
Y
N
Replace the control panel AP1
N
Y
End

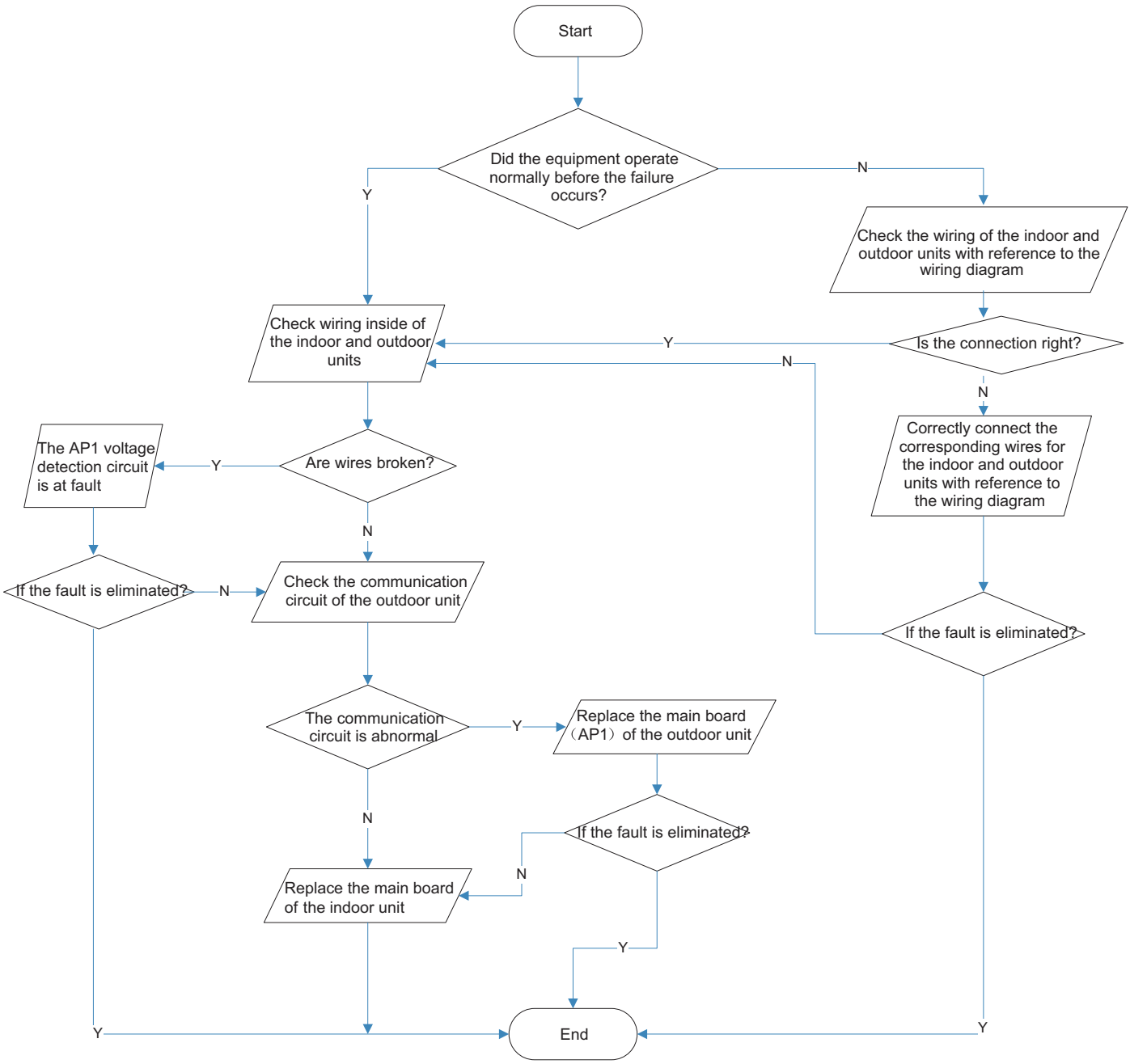
(8) Communication malfunction: (following AP1 for outdoor unit control board)

Mainly detect:

●Is there any damage for the indoor unit mainboard communication circuit? Is communication circuit damaged?

●Detect the indoor and outdoor units connection wire and indoor and outdoor units inside wiring is connect well or not, if is there any damage?

Fault diagnosis process:

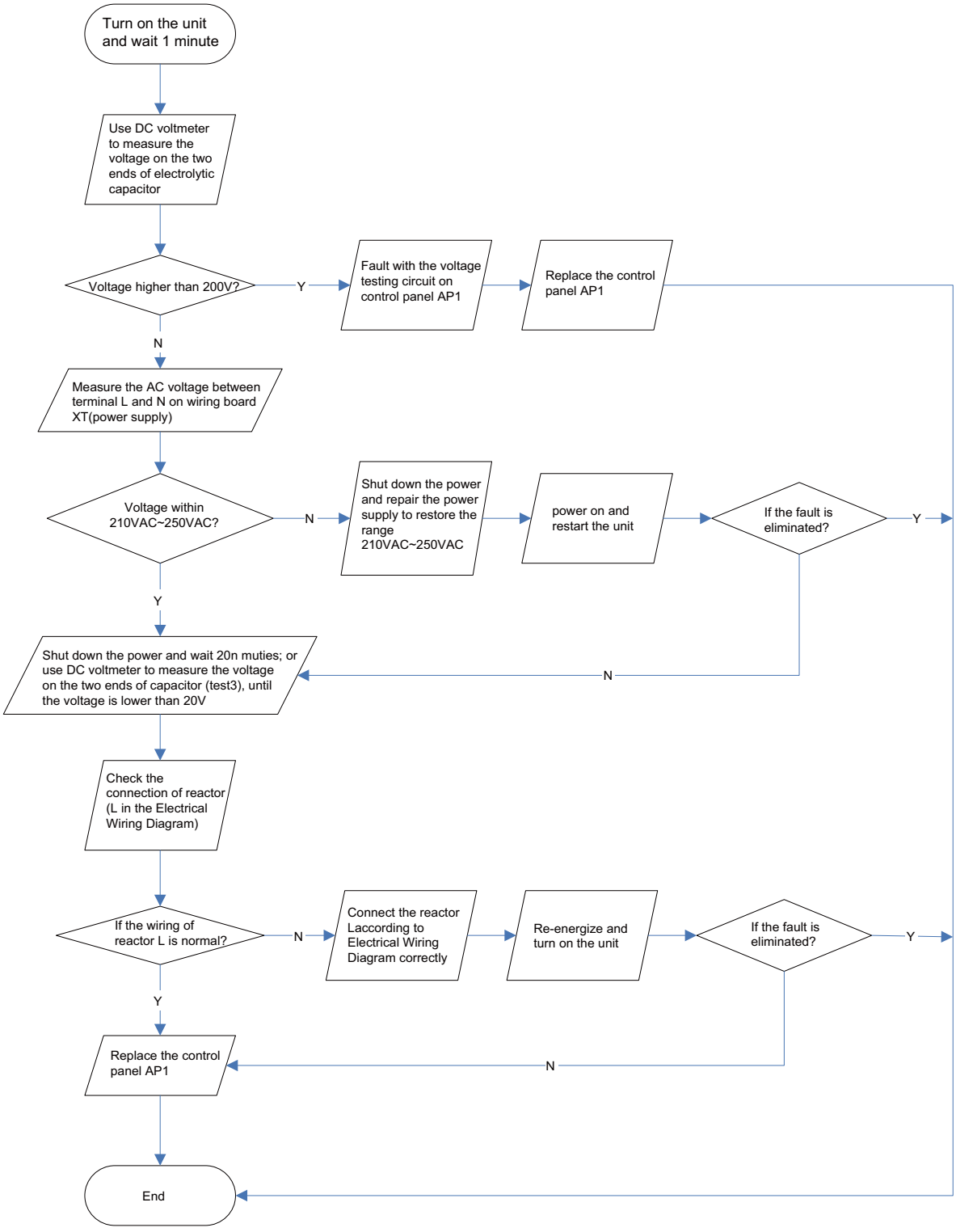

Start
Did the equipment operate normally before the failure occurs?
Y
N
Check the wiring of the indoor and outdoor units with reference to the wiring diagram
Is the connection right?
Y
N
Check wiring inside of the indoor and outdoor units
N
Correctly connect the corresponding wires for the indoor and outdoor units with reference to the wiring diagram
Are wires broken?
Y
The AP1 voltage detection circuit is at fault
N
If the fault is eliminated?
N
Check the communication circuit of the outdoor unit
If the fault is eliminated?
The communication circuit is abnormal
Y
Replace the main board （AP1） of the outdoor unit
N
If the fault is eliminated?
N
Replace the main board of the indoor unit
Y
Y
End
Y

(1) Capacitor charging malfunction (outdoor unit malfunction)

Outdoor unit malfunction indicator status

D5	D6	D16	D30
□	■	□	■

Main detection point:
●Detect if the voltage of L and N terminal of wiring board is between 210AC-240AC by alternating voltage meter;
●Is reactor (L) well connected? Is connection wire loosened or pull-out? Is reactor (L) damaged?
Malfunction diagnosis process:


Turn on the unit and wait 1 minute
Use DC voltmeter to measure the voltage on the two ends of electrolytic capacitor
Voltage higher than 200V?
Y
Fault with the voltage testing circuit on control panel AP1
Replace the control panel AP1
N
Measure the AC voltage between terminal L and N on wiring board XT(power supply)
Voltage within 210VAC~250VAC?
N
Shut down the power and repair the power supply to restore the range 210VAC~250VAC
power on and restart the unit
If the fault is eliminated?
Y
Y
Shut down the power and wait 20n muties; or use DC voltmeter to measure the voltage on the two ends of capacitor (test3), until the voltage is lower than 20V
N
Check the connection of reactor (L in the Electrical Wiring Diagram)
If the wiring of reactor L is normal?
N
Connect the reactor Laccording to Electrical Wiring Diagram correctly
Re-energize and turn on the unit
If the fault is eliminated?
Y
Y
Replace the control panel AP1
N
End

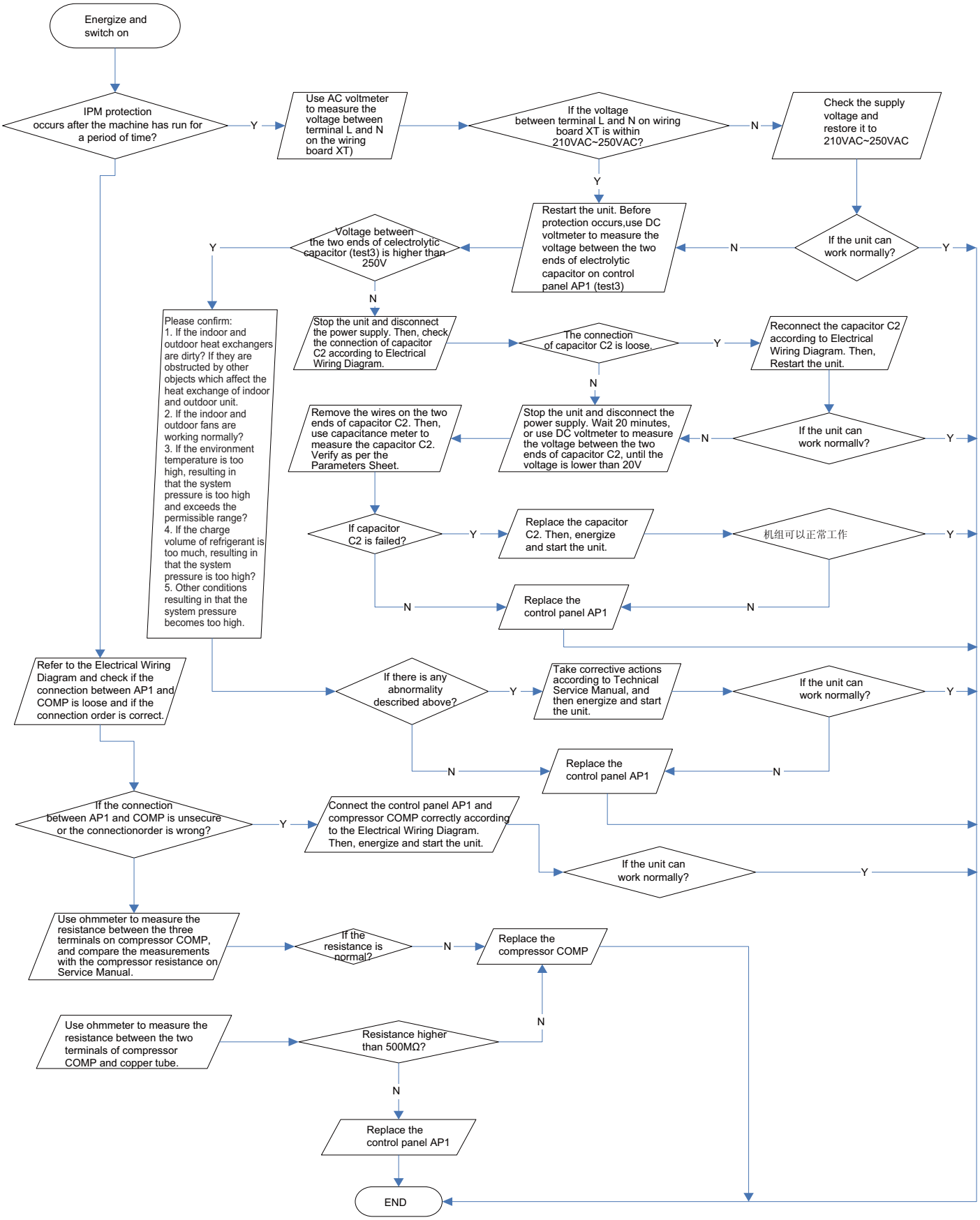
(2) IPM protection, desynchronizing malfunction, phase current of compressor is overcurrent (outdoor unit malfunction)

Outdoor unit malfunction indicator status

Malfunction	D5	D6	D16	D30
IPM protection	□	☆	□	■
Desynchronizing malfunction	□	☆	■	☆
Compressor overcurrent	□	☆	□	□

Main detection point:
●If control board AP1 and compressor COMP is well connected? If they are loosened? If the connection sequence is correct?
●Is voltage input in the normal range (Test the voltage between L, N of wiring board XT by DC voltage meter)?
●If coil resistance of compressor is normal? Is compressor coil insulating to copper pipe well?
●If the work load of unit is heavy? If radiating of unit is well? If the refrigerant charging is appropriate?

Malfunction diagnosis process:


Energize and switch on
IPM protection occurs after the machine has run for a period of time?
Y
Use AC voltmeter to measure the voltage between terminal L and N on the wiring board XT)
If the voltage between terminal L and N on wiring board XT is within 210VAC~250VAC?
N
Check the supply voltage and restore it to 210VAC~250VAC
Y
Restart the unit. Before protection occurs,use DC voltmeter to measure the voltage between the two ends of electrolytic capacitor on control panel AP1 (test3)
N
If the unit can work normally?
Y
Voltage between the two ends of celectrolytic capacitor (test3) is higher than 250V
Y
N
Please confirm:
1. If the indoor and outdoor heat exchangers are dirty? If they are obstructed by other objects which affect the heat exchange of indoor and outdoor unit.
2. If the indoor and outdoor fans are working normally?
3. If the environment temperature is too high, resulting in that the system pressure is too high and exceeds the permissible range?
4. If the charge volume of refrigerant is too much, resulting in that the system pressure is too high?
5. Other conditions resulting in that the system pressure becomes too high.
Stop the unit and disconnect the power supply. Then, check the connection of capacitor C2 according to Electrical Wiring Diagram.
The connection of capacitor C2 is loose.
Y
Reconnect the capacitor C2 according to Electrical Wiring Diagram. Then, Restart the unit.
N
If the unit can work normallv?
Y
N
Stop the unit and disconnect the power supply. Wait 20 minutes, or use DC voltmeter to measure the voltage between the two ends of capacitor C2, until the voltage is lower than 20V
Remove the wires on the two ends of capacitor C2. Then, use capacitance meter to measure the capacitor C2. Verify as per the Parameters Sheet.
If capacitor C2 is failed?
Y
Replace the capacitor C2. Then, energize and start the unit.
机组可以正常工作
Y
N
Replace the control panel AP1
N
Refer to the Electrical Wiring Diagram and check if the connection between AP1 and COMP is loose and if the connection order is correct.
If there is any abnormality described above?
Y
Take corrective actions according to Technical Service Manual, and then energize and start the unit.
If the unit can work normally?
Y
N
Replace the control panel AP1
N
If the connection between AP1 and COMP is unsecure or the connectionorder is wrong?
Y
Connect the control panel AP1 and compressor COMP correctly according to the Electrical Wiring Diagram. Then, energize and start the unit.
If the unit can work normally?
Y
Use ohmmeter to measure the resistance between the three terminals on compressor COMP, and compare the measurements with the compressor resistance on Service Manual.
If the resistance is normal?
N
Replace the compressor COMP
Use ohmmeter to measure the resistance between the two terminals of compressor COMP and copper tube.
Resistance higher than 500MΩ?
N
N
Replace the control panel AP1
END

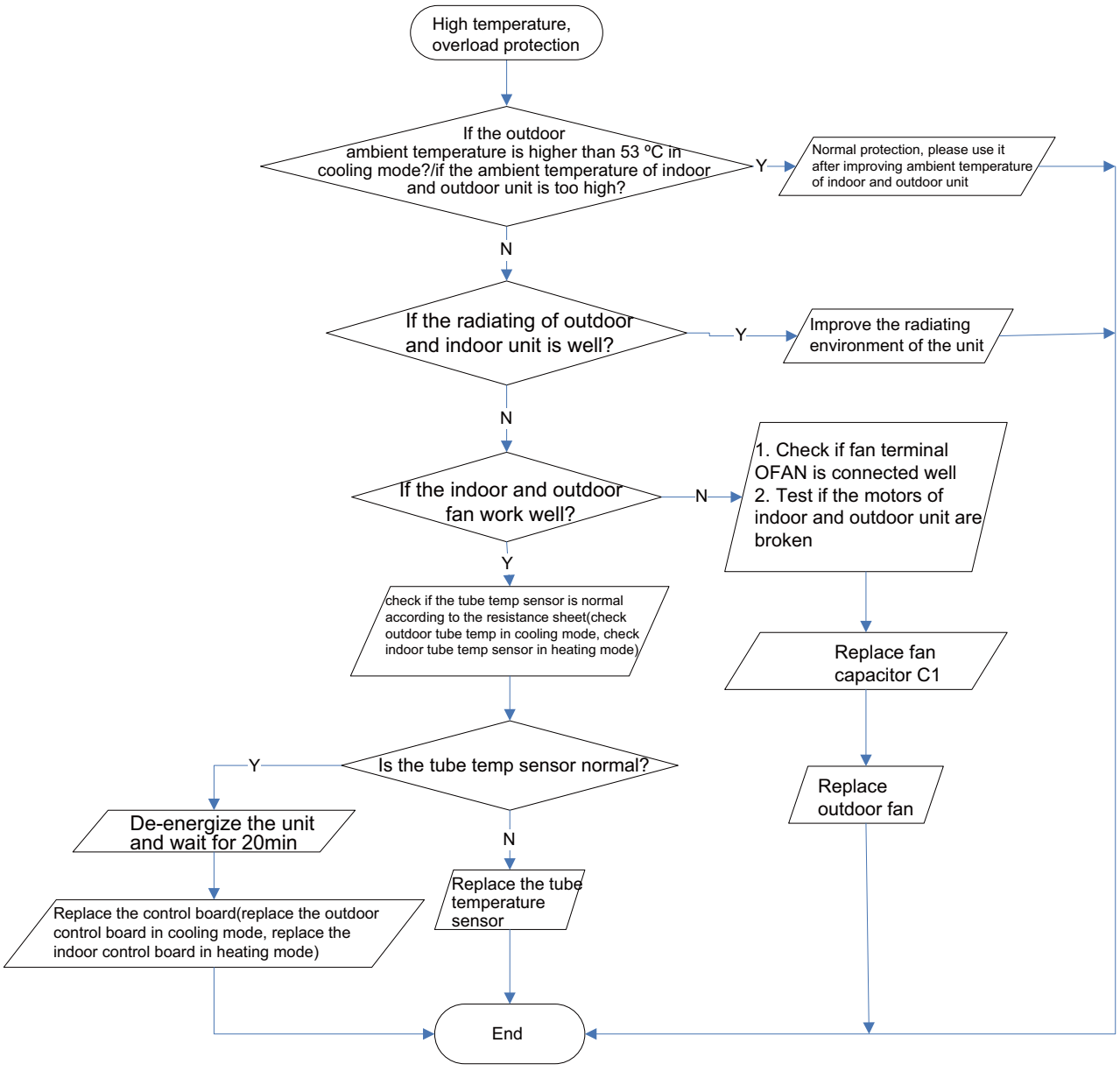
(3) Diagnosis for high temperature, overload protection (check outdoor unit in cooling mode and check indoor unit in heating mode)

Outdoor unit malfunction indicator status

D5	D6	D16	D30
■	□	■	■

Main detection point:
●If the outdoor ambient temperature is in normal range;
●If the indoor and outdoor fan is running normally;
●If the radiating environment inside and outside the unit is well (including if the fan speed is too low)?
●If the tube temperature sensor of indoor and outdoor unit is normal?

Malfunction diagnosis process:


High temperature, overload protection
If the outdoor ambient temperature is higher than 53 ºC in cooling mode?/if the ambient temperature of indoor and outdoor unit is too high?
Y
Normal protection, please use it after improving ambient temperature of indoor and outdoor unit
N
If the radiating of outdoor and indoor unit is well?
Y
Improve the radiating environment of the unit
N
If the indoor and outdoor fan work well?
N
1. Check if fan terminal OFAN is connected well
2. Test if the motors of indoor and outdoor unit are broken
Y
check if the tube temp sensor is normal according to the resistance sheet(check outdoor tube temp in cooling mode, check indoor tube temp sensor in heating mode)
Replace fan capacitor C1
Is the tube temp sensor normal?
Y
Replace outdoor fan
De-energize the unit and wait for 20min
N
Replace the tube temperature sensor
Replace the control board(replace the outdoor control board in cooling mode, replace the indoor control board in heating mode)
End

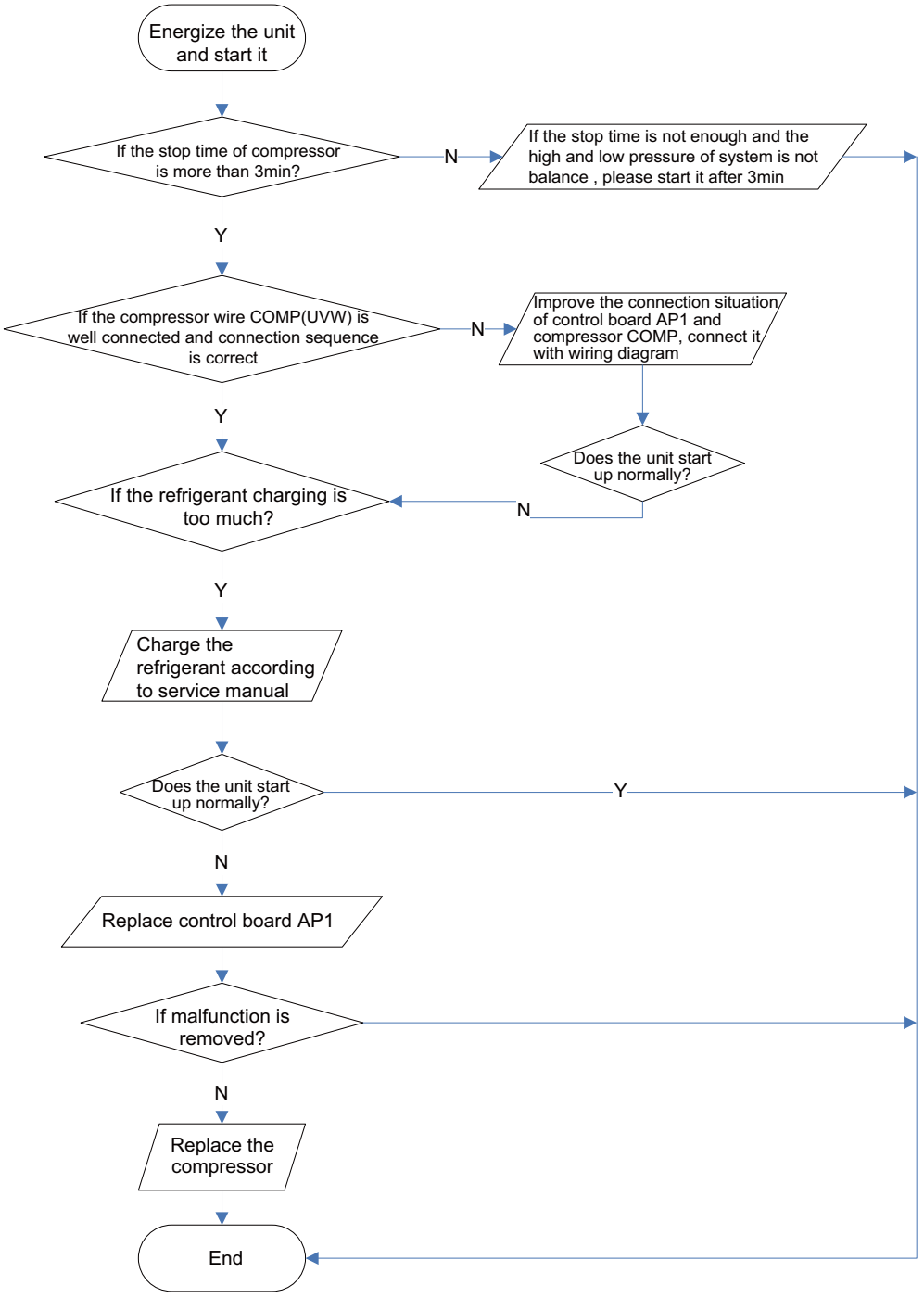
(4) Diagnosis for failure start up malfunction (outdoor unit malfunction)

Outdoor unit malfunction indicator status

D5	D6	D16	D30
□	☆	□	☆

Main detection point:
- ●If the compressor wiring is correct?
- ●If the stop time of compressor is enough?
- ●If the compressor is damaged?
- ●If the refrigerant charging is too much?

Malfunction diagnosis process:


Energize the unit and start it
If the stop time of compressor is more than 3min?
N
If the stop time is not enough and the high and low pressure of system is not balance , please start it after 3min
Y
If the compressor wire COMP(UVW) is well connected and connection sequence is correct
N
Improve the connection situation of control board AP1 and compressor COMP, connect it with wiring diagram
Does the unit start up normally?
Y
If the refrigerant charging is too much?
N
Y
Charge the refrigerant according to service manual
Does the unit start up normally?
Y
N
Replace control board AP1
If malfunction is removed?
N
Replace the compressor
End

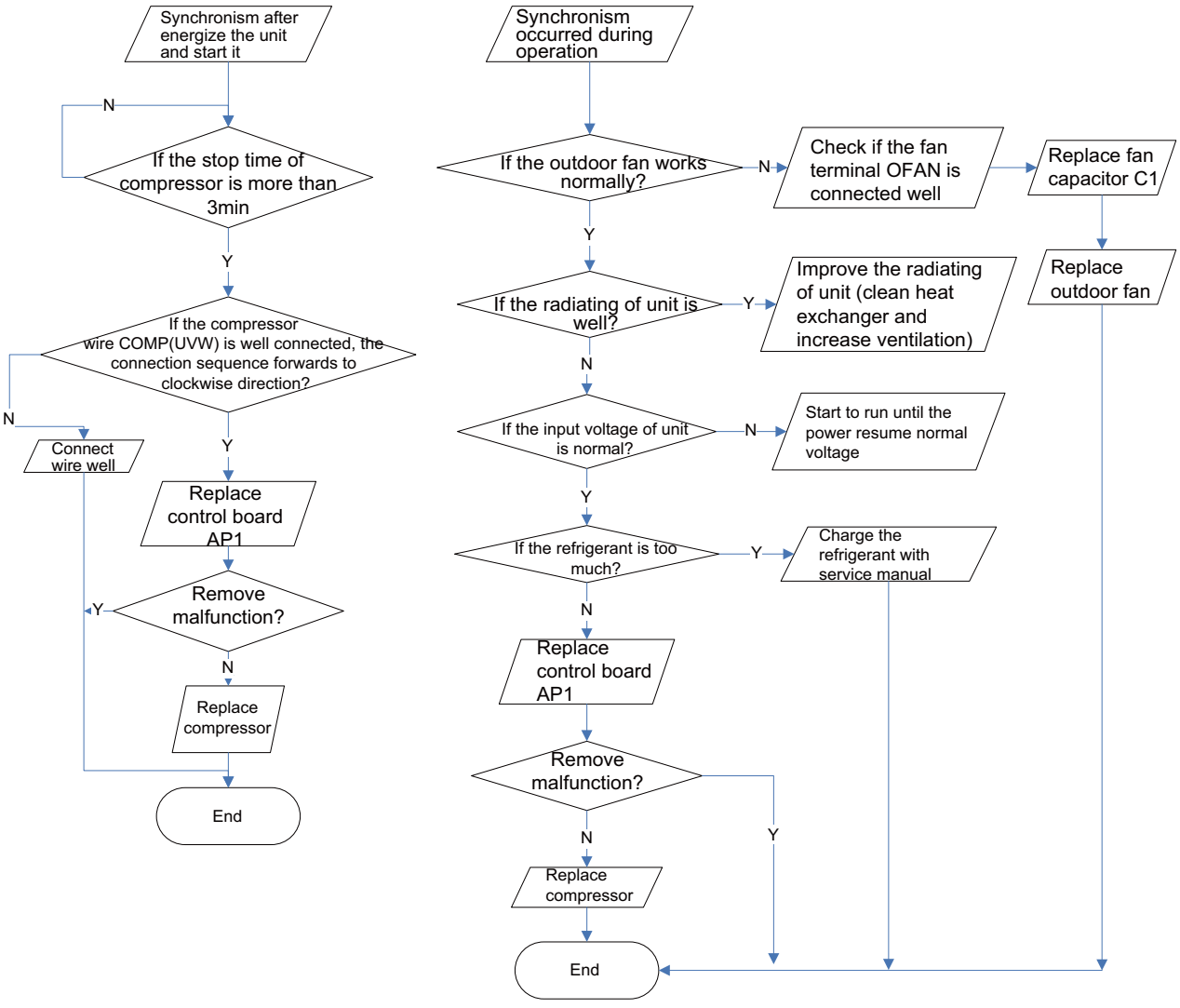
(5) Diagnosis for compressor synchronism (outdoor unit malfunction)

Outdoor unit malfunction indicator status

D5	D6	D16	D30
□	☆	■	☆

Main detection point:
●If the system pressure is over-high?
●If the working voltage is over-low?

Malfunction diagnosis process:



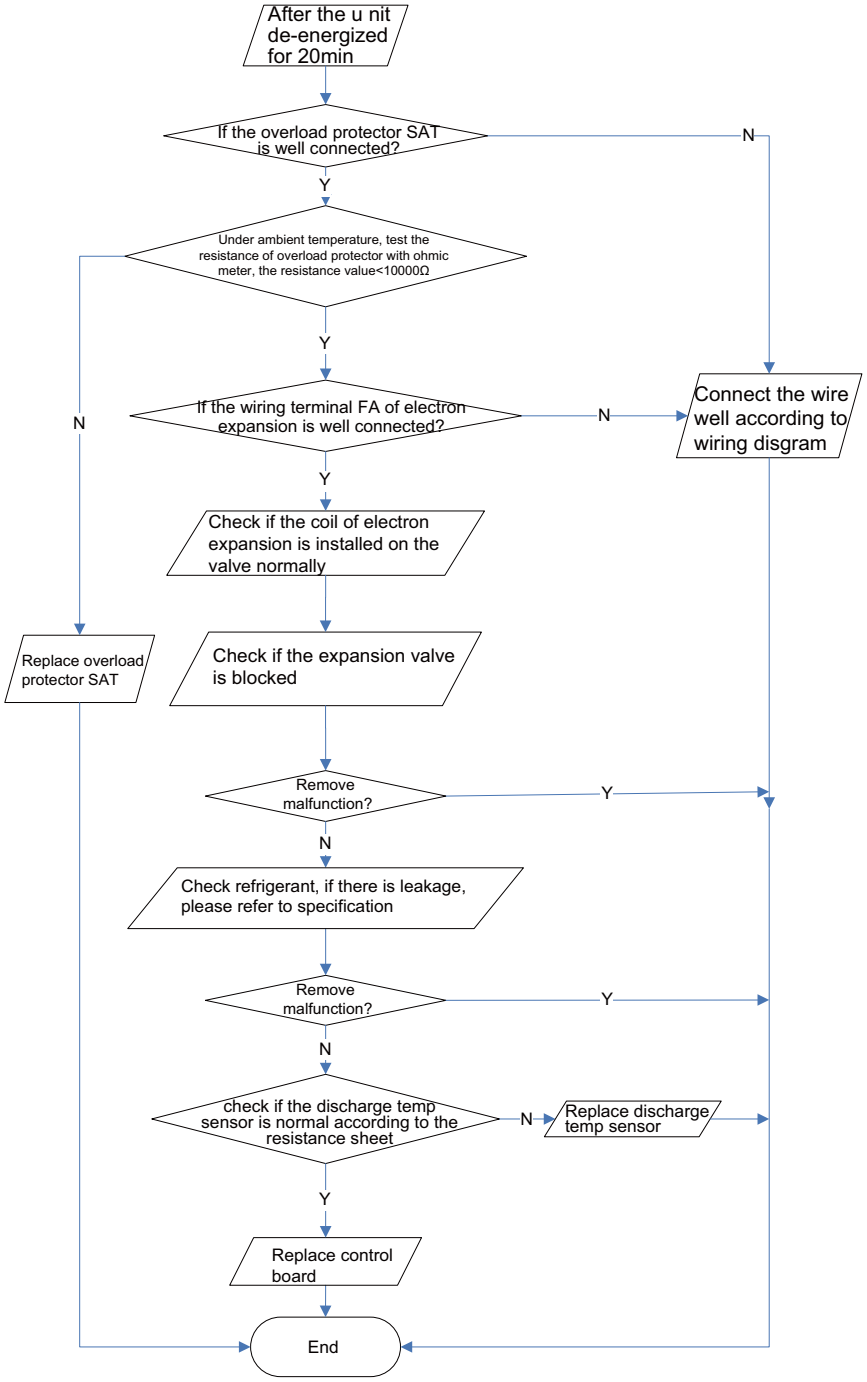
(6)Diagnosis for overload and discharge malfunction (outdoor unit malfunction)

Outdoor unit malfunction indicator status

Malfunction	D5	D6	D16	D30
Overload	□	☆	☆	□
Discharge	■	□	■	☆

Main detection point:
●If the electron expansion valve is connected well? Is the expansion valve damaged?
●If the refrigerant is leakage?
●If the overload protector is damaged?
●If the discharge temp sensor is damaged?

Malfunction diagnosis process:


After the u nit de-energized for 20min
If the overload protector SAT is well connected?
N
Y
Under ambient temperature, test the resistance of overload protector with ohmic meter, the resistance value<10000Ω
Y
If the wiring terminal FA of electron expansion is well connected?
N
N
Connect the wire well according to wiring disgram
Y
Check if the coil of electron expansion is installed on the valve normally
Replace overload protector SAT
Check if the expansion valve is blocked
Remove malfunction?
Y
N
Check refrigerant, if there is leakage, please refer to specification
Remove malfunction?
Y
N
check if the discharge temp sensor is normal according to the resistance sheet
N
Replace discharge temp sensor
Y
Replace control board
End

(7) Communication malfunction

Outdoor unit malfunction indicator status

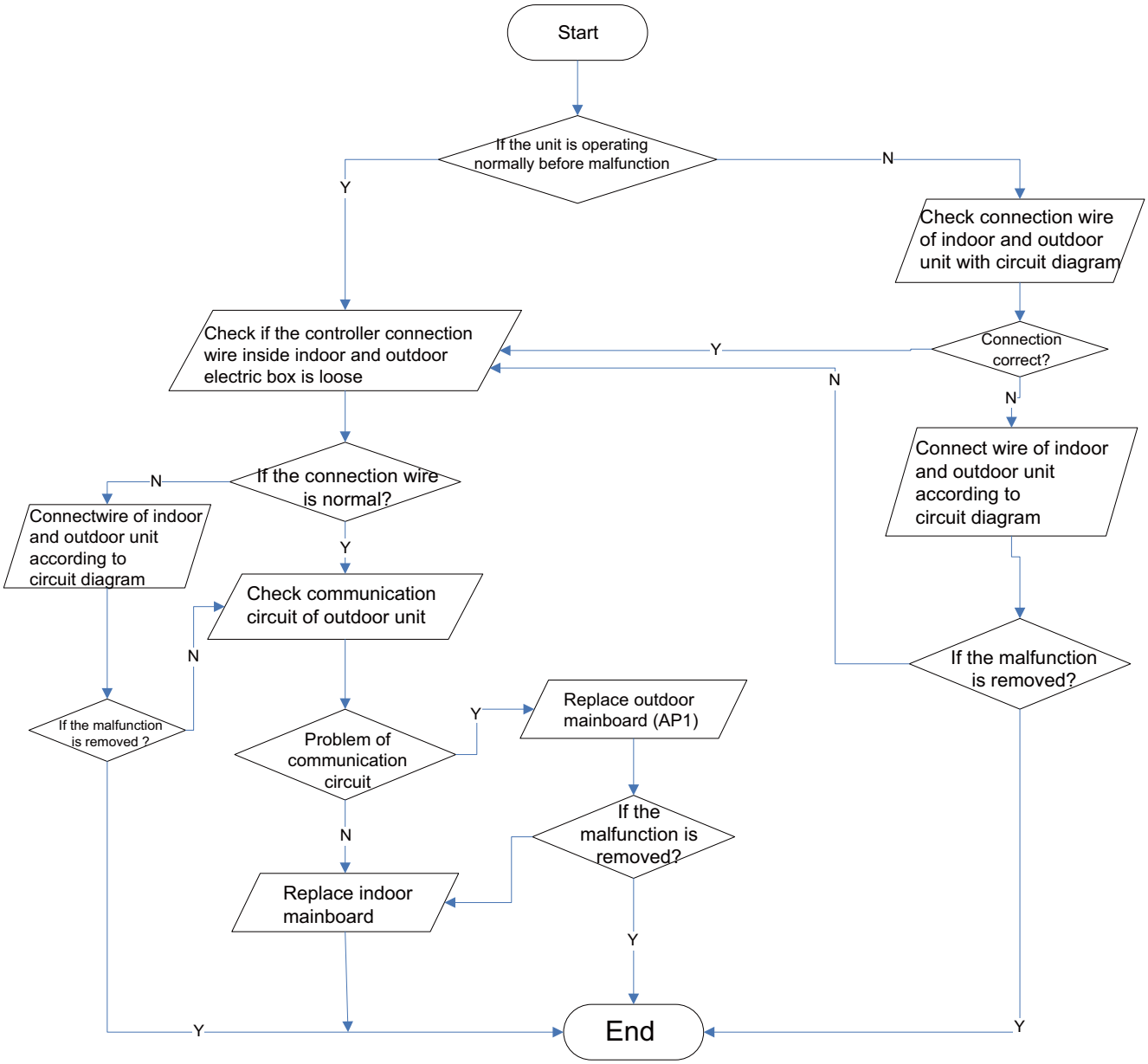
D5	D6	D16	D30
☐	☐	☐	☆

Main detection point:

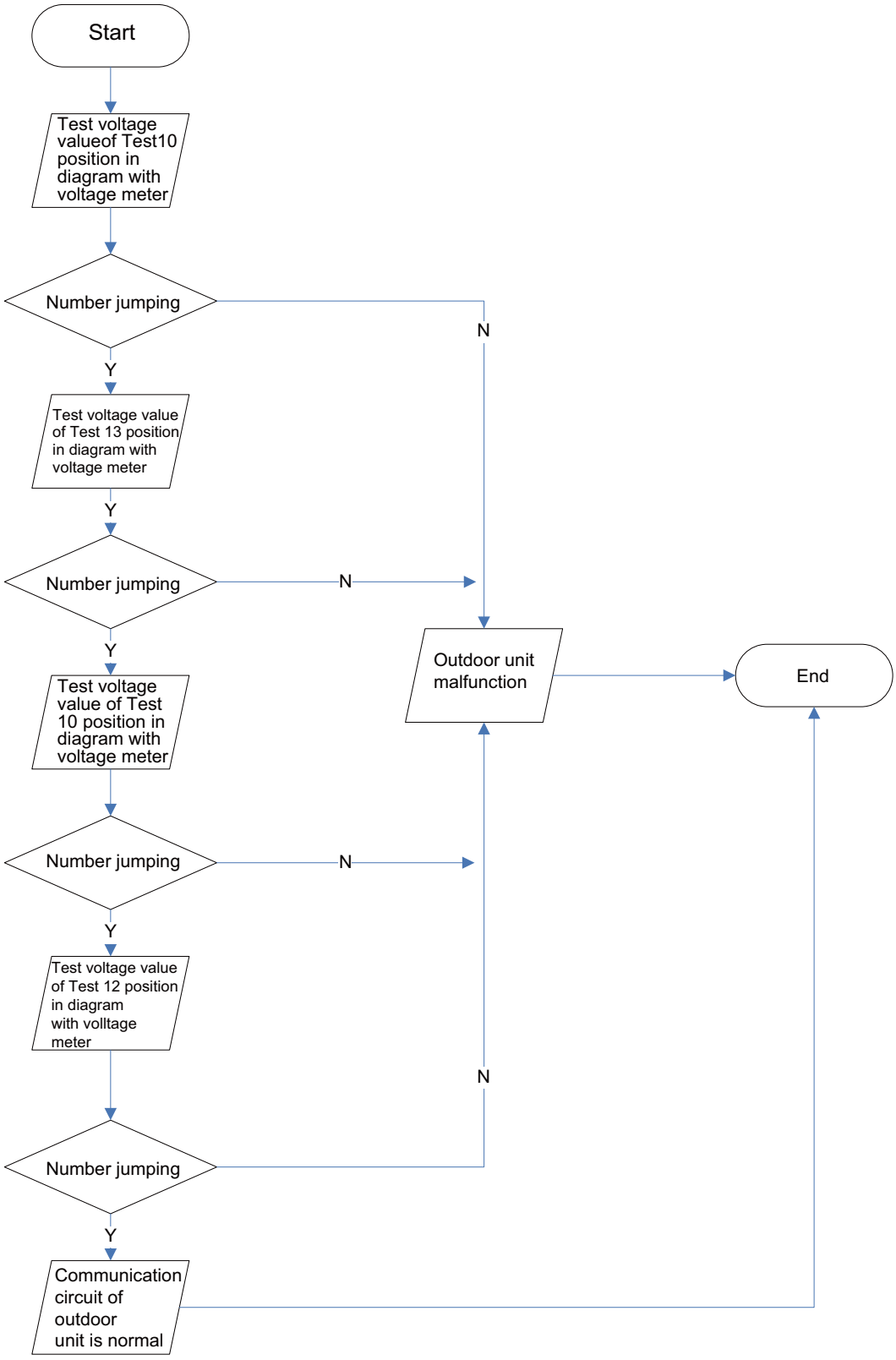
●Check if the connection wire and the built-in wiring of indoor and outdoor unit is connected well and no damaged;

●If the communication circuit of indoor mainboard is damaged? If the communication circuit of outdoor mainboard (AP1) is damaged?

Malfunction diagnosis process:



Diagnosis process for outdoor communication circuit (refer to the key detection points of outdoor unit)



Appendix:

Appendix 1: Reference Sheet of Celsius and Fahrenheit

Conversion formula for Fahrenheit degree and Celsius degree: Tf=Tcx1.8+32

Set temperature

Fahrenheit display temperature (℉)	Fahrenheit (℉)	Celsius (℃)		Fahrenheit display temperature (℉)	Fahrenheit (℉)	Celsius (℃)		Fahrenheit display temperature (℉)	Fahrenheit (℉)	Celsius (℃)
61	60.8	16		69/70	69.8	21		78/79	78.8	26
62/63	62.6	17		71/72	71.6	22		80/81	80.6	27
64/65	64.4	18		73/74	73.4	23		82/83	82.4	28
66/67	66.2	19		75/76	75.2	24		84/85	84.2	29
68	68	20		77	77	25		86	86	30

Ambient temperature

Fahrenheit display temperature (℉)	Fahrenheit (℉)	Celsius (℃)		Fahrenheit display temperature (℉)	Fahrenheit (℉)	Celsius (℃)		Fahrenheit display temperature (℉)	Fahrenheit (℉)	Celsius (℃)
32/33	32	0		55/56	55.4	13		79/80	78.8	26
34/35	33.8	1		57/58	57.2	14		81	80.6	27
36	35.6	2		59/60	59	15		82/83	82.4	28
37/38	37.4	3		61/62	60.8	16		84/85	84.2	29
39/40	39.2	4		63	62.6	17		86/87	86	30
41/42	41	5		64/65	64.4	18		88/89	87.8	31
43/44	42.8	6		66/67	66.2	19		90	89.6	32
45	44.6	7		68/69	68	20		91/92	91.4	33
46/47	46.4	8		70/71	69.8	21		93/94	93.2	34
48/49	48.2	9		72	71.6	22		95/96	95	35
50/51	50	10		73/74	73.4	23		97/98	96.8	36
52/53	51.8	11		75/76	75.2	24		99	98.6	37
54	53.6	12		77/78	77	25				

Appendix 2: Configuration of Connection Pipe

1.Standard length of connection pipe

● 5m, 7.5m, 8m.

2.Min. length of connection pipe is 3m.

3.Max. length of connection pipe and max. high difference.

4.The additional refrigerant oil and refrigerant charging required after prolonging connection pipe

● After the length of connection pipe is prolonged for 10m at the basis of standard length, you should add 5ml of refrigerant oil for each additional 5m of connection pipe.

● The calculation method of additional refrigerant charging amount (on the basis of liquid pipe):

Cooling capacity	Max length of connection pipe	Max height difference
5000 Btu/h(1465 W)	15 m	5 m
7000 Btu/h(2051 W)	15 m	5 m
9000 Btu/h(2637 W)	15 m	10 m
12000 Btu/h(3516 W)	20 m	10 m
18000 Btu/h(5274 W)	25 m	10 m
24000 Btu/h(7032 W)	25 m	10 m
28000 Btu/h(8204 W)	30 m	10 m
36000 Btu/h(10548 W)	30 m	20 m
42000 Btu/h(12306 W)	30 m	20 m
48000 Btu/h(14064 W)	30 m	20 m

● When the length of connection pipe is above 5m, add refrigerant according to the prolonged length of liquid pipe. The additional refrigerant charging amount per meter is different according to the diameter of liquid pipe. See the following sheet.

● Additional refrigerant charging amount = prolonged length of liquid pipe X additional refrigerant charging amount per meter

Additional refrigerant charging amount for R22, R407C, R410A and R134a			
Diameter of connection pipe		Outdoor unit throttle	
Liquid pipe(mm)	Gas pipe(mm)	Cooling only(g/m)	Cooling and heating(g/m)
Φ6	Φ9.5 or Φ12	15	20
Φ6 or Φ9.5	Φ16 or Φ19	15	20
Φ12	Φ19 or Φ22.2	30	120
Φ16	Φ25.4 or Φ31.8	60	120
Φ19	/	250	250
Φ22.2	/	350	350

Appendix 4: List of Resistance for Ambient Temperature Sensor

3Resistance Table of Ambient Temperature Sensor for Indoor and Outdoor Units(15K)

Temp(°C)	Resistance(kΩ)		Temp(°C)	Resistance(kΩ)		Temp(°C)	Resistance(kΩ)		Temp(°C)	Resistance(kΩ)
-19	138.1		20	18.75		59	3.848		98	1.071
-18	128.6		21	17.93		60	3.711		99	1.039
-17	121.6		22	17.14		61	3.579		100	1.009
-16	115		23	16.39		62	3.454		101	0.98
-15	108.7		24	15.68		63	3.333		102	0.952
-14	102.9		25	15		64	3.217		103	0.925
-13	97.4		26	14.36		65	3.105		104	0.898
-12	92.22		27	13.74		66	2.998		105	0.873
-11	87.35		28	13.16		67	2.896		106	0.848
-10	82.75		29	12.6		68	2.797		107	0.825
-9	78.43		30	12.07		69	2.702		108	0.802
-8	74.35		31	11.57		70	2.611		109	0.779
-7	70.5		32	11.09		71	2.523		110	0.758
-6	66.88		33	10.63		72	2.439		111	0.737
-5	63.46		34	10.2		73	2.358		112	0.717
-4	60.23		35	9.779		74	2.28		113	0.697
-3	57.18		36	9.382		75	2.206		114	0.678
-2	54.31		37	9.003		76	2.133		115	0.66
-1	51.59		38	8.642		77	2.064		116	0.642
0	49.02		39	8.297		78	1.997		117	0.625
1	46.6		40	7.967		79	1.933		118	0.608
2	44.31		41	7.653		80	1.871		119	0.592
3	42.14		42	7.352		81	1.811		120	0.577
4	40.09		43	7.065		82	1.754		121	0.561
5	38.15		44	6.791		83	1.699		122	0.547
6	36.32		45	6.529		84	1.645		123	0.532
7	34.58		46	6.278		85	1.594		124	0.519
8	32.94		47	6.038		86	1.544		125	0.505
9	31.38		48	5.809		87	1.497		126	0.492
10	29.9		49	5.589		88	1.451		127	0.48
11	28.51		50	5.379		89	1.408		128	0.467
12	27.18		51	5.197		90	1.363		129	0.456
13	25.92		52	4.986		91	1.322		130	0.444
14	24.73		53	4.802		92	1.282		131	0.433
15	23.6		54	4.625		93	1.244		132	0.422
16	22.53		55	4.456		94	1.207		133	0.412
17	21.51		56	4.294		95	1.171		134	0.401
18	20.54		57	4.139		96	1.136		135	0.391
19	19.63		58	3.99		97	1.103		136	0.382

Resistance Table of Ambient Temperature Sensor for Indoor and Outdoor Units(20K)

Temp(°C)	Resistance(kΩ)		Temp(°C)	Resistance(kΩ)		Temp(°C)	Resistance(kΩ)		Temp(°C)	Resistance(kΩ)
-19	181.4		20	25.01		59	5.13		98	1.427
-18	171.4		21	23.9		60	4.948		99	1.386
-17	162.1		22	22.85		61	4.773		100	1.346
-16	153.3		23	21.85		62	4.605		101	1.307
-15	145		24	20.9		63	4.443		102	1.269
-14	137.2		25	20		64	4.289		103	1.233
-13	129.9		26	19.14		65	4.14		104	1.198
-12	123		27	18.13		66	3.998		105	1.164
-11	116.5		28	17.55		67	3.861		106	1.131
-10	110.3		29	16.8		68	3.729		107	1.099
-9	104.6		30	16.1		69	3.603		108	1.069
-8	99.13		31	15.43		70	3.481		109	1.039
-7	94		32	14.79		71	3.364		110	1.01
-6	89.17		33	14.18		72	3.252		111	0.983
-5	84.61		34	13.59		73	3.144		112	0.956
-4	80.31		35	13.04		74	3.04		113	0.93
-3	76.24		36	12.51		75	2.94		114	0.904
-2	72.41		37	12		76	2.844		115	0.88
-1	68.79		38	11.52		77	2.752		116	0.856
0	65.37		39	11.06		78	2.663		117	0.833
1	62.13		40	10.62		79	2.577		118	0.811
2	59.08		41	10.2		80	2.495		119	0.77
3	56.19		42	9.803		81	2.415		120	0.769
4	53.46		43	9.42		82	2.339		121	0.746
5	50.87		44	9.054		83	2.265		122	0.729
6	48.42		45	8.705		84	2.194		123	0.71
7	46.11		46	8.37		85	2.125		124	0.692
8	43.92		47	8.051		86	2.059		125	0.674
9	41.84		48	7.745		87	1.996		126	0.658
10	39.87		49	7.453		88	1.934		127	0.64
11	38.01		50	7.173		89	1.875		128	0.623
12	36.24		51	6.905		90	1.818		129	0.607
13	34.57		52	6.648		91	1.736		130	0.592
14	32.98		53	6.403		92	1.71		131	0.577
15	31.47		54	6.167		93	1.658		132	0.563
16	30.04		55	5.942		94	1.609		133	0.549
17	28.68		56	5.726		95	1.561		134	0.535
18	27.39		57	5.519		96	1.515		135	0.521
19	26.17		58	5.32		97	1.47		136	0.509

Resistance Table of Ambient Temperature Sensor for Indoor and Outdoor Units(50K)

Temp(°C)	Resistance(kΩ)		Temp(°C)	Resistance(kΩ)		Temp(°C)	Resistance(kΩ)		Temp(°C)	Resistance(kΩ)
-29	853.5		10	98		49	18.34		88	4.75
-28	799.8		11	93.42		50	17.65		89	4.61
-27	750		12	89.07		51	16.99		90	4.47
-26	703.8		13	84.95		52	16.36		91	4.33
-25	660.8		14	81.05		53	15.75		92	4.20
-24	620.8		15	77.35		54	15.17		93	4.08
-23	580.6		16	73.83		55	14.62		94	3.96
-22	548.9		17	70.5		56	14.09		95	3.84
-21	516.6		18	67.34		57	13.58		96	3.73
-20	486.5		19	64.33		58	13.09		97	3.62
-19	458.3		20	61.48		59	12.62		98	3.51
-18	432		21	58.77		60	12.17		99	3.41
-17	407.4		22	56.19		61	11.74		100	3.32
-16	384.5		23	53.74		62	11.32		101	3.22
-15	362.9		24	51.41		63	10.93		102	3.13
-14	342.8		25	49.19		64	10.54		103	3.04
-13	323.9		26	47.08		65	10.18		104	2.96
-12	306.2		27	45.07		66	9.83		105	2.87
-11	289.6		28	43.16		67	9.49		106	2.79
-10	274		29	41.34		68	9.17		107	2.72
-9	259.3		30	39.61		69	8.85		108	2.64
-8	245.6		31	37.96		70	8.56		109	2.57
-7	232.6		32	36.38		71	8.27		110	2.50
-6	220.5		33	34.88		72	7.99		111	2.43
-5	209		34	33.45		73	7.73		112	2.37
-4	198.3		35	32.09		74	7.47		113	2.30
-3	199.1		36	30.79		75	7.22		114	2.24
-2	178.5		37	29.54		76	7.00		115	2.18
-1	169.5		38	28.36		77	6.76		116	2.12
0	161		39	27.23		78	6.54		117	2.07
1	153		40	26.15		79	6.33		118	2.02
2	145.4		41	25.11		80	6.13		119	1.96
3	138.3		42	24.13		81	5.93		120	1.91
4	131.5		43	23.19		82	5.75		121	1.86
5	125.1		44	22.29		83	5.57		122	1.82
6	119.1		45	21.43		84	5.39		123	1.77
7	113.4		46	20.6		85	5.22		124	1.73
8	108		47	19.81		86	5.06		125	1.68
9	102.8		48	19.06		87	4.90		126	1.64

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